

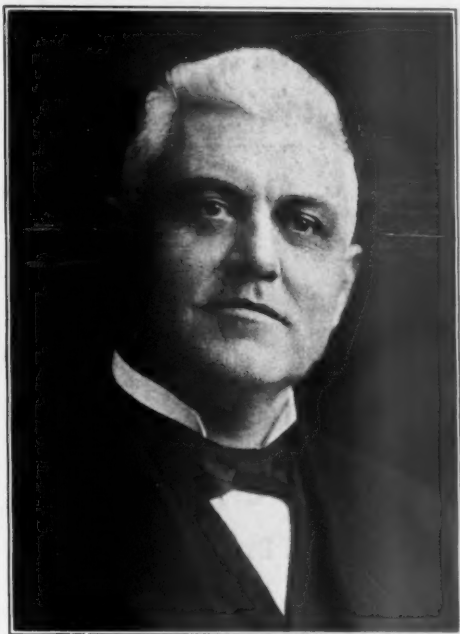
THE MINING CONGRESS JOURNAL

VOL. II

SAFETY-EFFICIENCY-CONSERVATION

MAY, 1916

No. 5



DR. MARTIN D. FOSTER

Who discusses mining law revision in this issue

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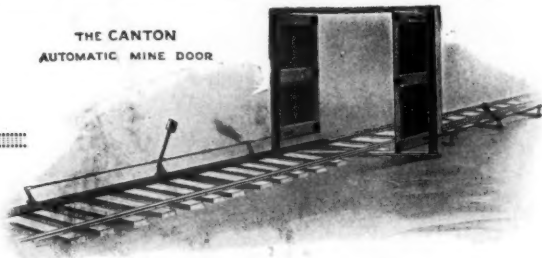
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Second—Intelligent conservation with a view to the highest development and use of our mineral resources.

Third—The stimulation of investment in practical mining operations by showing that mining is a legitimate business when intelligently conducted.

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THE MINING CONGRESS JOURNAL

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DR. MARTIN D. FOSTER URGES ALL MINING MEN TO CRITICIZE HIS BILL

Chairman of House Committee on Mines and Mining Believes Mining Laws Can Be Revised Without Delay and Uncertainties of a Commission—

He Discusses His Bill in Detail

Dr. Martin D. Foster, chairman of the Committee on Mines and Mining, urges that all mining men study his bill providing for the revision of the mining laws. Dr. Foster is of the opinion that a commission is not necessary to ascertain the legislation needed by the industry. He thinks all persons interested in the mining industry, whether or not they consider a committee indispensable, should be willing to give a trial to this attempt to frame a mining law without having to resort to the expense and delay of a commission. The following statement sets forth Dr. Foster's views of the bill:

The House Committee on Mines and Mining has introduced a bill (H. R. 12,275) looking to the complete revision of the existing mining laws. The committee by vote of 8 to 7 refused to approve the bill for the appointment of a commission under the belief that a revision of the mining laws could be accomplished in less time with less expense.

The new bill leaves many of the provisions of the old law unchanged and the changes proposed are along the lines and following the criticisms that have been made from time to time by persons interested in the mining enterprise.

OBJECTIONS SUMMED UP

It may be pointed out that the objections and criticisms to the existing mining laws have by various speakers and writers, been crystallized into eleven concrete objections, as follows:

1. Apex law or extralateral rights' provision should be repealed.
2. Discovery and location should not be a unit, and time should be given for discovery.
3. The number of lode or quartz locations or claims should be limited.

4. Application of present law to oil and gas is insufficient.

5. Some mineral substances are not provided for.

6. Insufficient notices and want of record of locations.

7. Statute of limitations for attacking mineral patents.

8. Right of appeal from decision of General Land Office refusing patent.

9. Right of appeal to some competent court of law in all cases of contest between rival claimants, or between a locator and the government.

10. Holding locations indefinitely without performing assessment work by collusive relations.

11. Disturbance of titles by tunnel locations.

Objection No. 4 has been eliminated by what is known as the Ferris bill, passed by the House and now pending in the Senate.

Objection No. 5 is without merit as the matter contemplated has always been sufficiently covered in the present laws. The law as it was written May 10, 1872, expressly provides that "All valuable mineral deposits of lands belonging to the United States" are made free and open to exploration and purchase. More fortunate and more comprehensive language could not have been used, and any attempt to enlarge the scope of this language by naming or enumerating any particular minerals would be without reason.

MINERALS INCLUDED

Aside from the minerals expressly mentioned—gold, silver, cinnabar, lead, tin, and copper—the statute has been held to include the following: Alkaline substances, aluminum, amber, asphaltum, auriferous ce-

ment, borax, building stone, calcium phosphate, carbonate of lead, carbonate of soda, clays, coal, diamonds, fire clay, guano, gypsum, iron, iron oxide, kaolin, limestone, lustral stone, marble, mica, nitrate, oil, paint stone, petroleum, potash, rock phosphate, rock salt, salines, salt, salt springs, sand, sandstone, stone, sulphate of soda, sulphates and umber.

Objection No. 7 is groundless for the reason that in 1891 Congress passed a statute expressly limiting actions attacking patents thereafter issued to six years.

Objection No. 9 is also groundless for the reason that it has always been the law that all cases of contests between rival mineral claimants must be settled and determined by a court of competent jurisdiction and this rule applies alike to any contest over surface rights and subsurface rights. The existing law does not contemplate any "contest" between a locator and the government. The locator of a mining claim may, by the performance of the specified annual labor, hold his claim indefinitely with a title that for all practical purposes is equivalent to a patent. If he prefers he may, by making a certain amount of improvements on his claim, receive a patent therefor and on proof of a valid location and that the ground claimed contains valuable mineral deposits, and a proper certificate as to the required improvements, he is entitled to a patent. If any other person claims any right to the ground, or any part thereof, he must file his objections in the land office and commence an action to establish his claim in any court of competent jurisdiction.

The bill introduced for the reasons given makes no provisions as to these objections Nos. 4, 5, 7, and 9, except to incorporate the statute providing for limitations for attacking mineral patents, and providing for an appeal from the land office if a patent is refused.

DOES NOT REPEAL APEX LAW

The bill does not repeal what is familiarly known as the "apex law" or the extralateral rights provision of the present statutes. It was believed that a provision in the bill repealing this section of the old law would bring on a contest that might result in defeating the entire bill. It is well known that many prospectors and miners who have been and are actually engaged in prospecting, locating and operating mining claims, are strongly in favor of this extralateral rights' rule and would bitterly oppose any proposed repeal. But as shown hereafter the exercise of the right is by this bill somewhat and more definitely defined.

Objection No. 2 is regarded as the most reasonable that can be made to the existing mining laws. It was a most unfortunate provision that the location of a mining claim and discovery of mineral or "valuable mineral deposits" should be made a unit, that is, that no time should be given for making a location upon the ground for exploration and discovery of minerals. The federal statute has been supplemented by State legislation, giving thirty, sixty or ninety days in which to make a dis-

covery of minerals after the location has been made.

The existing law limits all claims to at least 1,500 feet in length along the lode and not exceeding 300 feet on each side of the center of a vein or lode, leaving the number of claims that any one person could locate unlimited. The proposed bill permits a single locator to make not more than five locations 1,500 by 600 feet along the vein or lode, and this may be done in the way of temporary locations with each claim properly marked by monuments or otherwise and this is designated as a temporary location, and the locator is then given one year after completing his temporary location in which to make a discovery of valuable mineral deposits sufficient to justify the working of the claim. The locator must then restake his claim and he may readjust the surface boundaries so that they will include the vein or lode as discovered below the surface, and he then makes his permanent location. If he obtains a patent for one or more of such claims and is in good faith developing the claims, he is then qualified to make additional or new locations; or if he files notice of abandonment of any one claim, he is then qualified to locate another or any number of claims equal to those so abandoned.

OPTION GIVEN

In lieu of the five locations above described a locator is given the option to locate one claim 2,100 feet square—equal in area to the five smaller claims—and on such claim he may make a temporary location and is given one year in which to make a discovery of minerals of sufficient value to justify the working of the claim. In this instance he is also given the right to shift the surface lines so as to derive the greatest possible benefit from the discovery as made and with the least possible loss to the investment in making his discovery.

Sec. 2322 of the new bill, which corresponds to the section of the existing law granting extralateral rights, provides for a location 1,500 by 600 feet, to be made on the outcrop of a vein or lode where no surface explorations are necessary and where a temporary location would not be required, and the locator in such case is given the right to follow the vein on its dip beyond the vertical planes of the side lines of his location, but he cannot follow the dip of his vein into any other location made prior to the date of his own location. Neither can he follow the vein on its dip into a location made one year or more after the date of his own location, if at the time the latter location was made he was not in good faith developing and working his own claim.

These provisions meet objections 1, 2 and 3, except, as suggested, the bill does not repeal absolutely the extralateral rights' provision of the existing law.

Objection No. 6. The bill recognizes the merits of this objection and provides for filing the notices of temporary and permanent locations with the register of the proper land

(Continued on page 247)

DAVID WHITE STANDS IN THE FRONT RANK OF WORLD'S PALEOBOTANISTS

**Chief Geologist of United States Geological Survey Has Done Remarkable Work
In Correlating Coal Beds—He Located Pocahontas Vein on
New River When All Others Failed.**

By M. R. Campbell

Soon after coming to the Geological Survey in 1886, David White, then a young man fresh from Cornell University, was assigned to work with Professor Lester F. Ward, one of the best informed men on fossil plants in the country. White became interested in the fossils and was soon giving much of his time to the study of ferns, that are so common in the Coal Measures of the Appalachian region. Despite the fact that scientific men of that day regarded fossil plants as making interesting specimens for museum purposes, but as wholly unreliable for the purpose of identifying coal beds, young White thought otherwise, and the more he studied the more he became impressed with the idea that in the past, plants had progressed and developed systematically as time went on, and that the comparative ages of rocks could be determined by a careful comparison of the remains of ferns and other plants that were buried in them.

About this time Mr. R. D. Lacoe, of Pittston, Pa., offered to give to the National Museum his large collection of fossil plants, if the Museum would label and correctly classify them. David White was selected for this work and the handling of this immense collection gave him an excellent opportunity to extent his knowledge of fossil plants. When this work was completed, he was sent by Dr. Walcott, then Chief Geologist of the Survey, into the coal fields to test in a practical way his ideas regarding the development of the ancient plants that formed the coal. It was in 1894 that White joined the party in charge of the writer in the coal fields of West Virginia, and the friendship then begun has continued and indeed grown throughout almost a quarter of a century.

The writer soon became convinced that White was correct in his interpretation of fossil plants and for four years work was carried on together in the most intimate manner; White determining the identity of the coal beds from place to place by means of the fossil plants, and the writer tracing the same beds by means of their outcrops. Although the latter method would seem to be the more reliable, the writer freely acknowledges that White with his fossil plants could beat him almost every time, and soon the



DAVID WHITE
Noted paleobotanist

evidences of the senses were not regarded as reliable unless they were confirmed by that of fossil plants.

For many years a standing reward had been offered to the man who could find the great Pocahontas coal bed on New River, some thirty or forty miles away from the Pocahontas field, but none could find it. David White, by the aid of fossil plants and actual tracing of the coal bed, located this famous coal, but found that it was only a foot or so thick. This discovery settled for all time the controversy as to whether or not the coal bed shows along New River and prevented further expenditure of time and money in a useless search.

Even the most eminent geologists of the

day have had to modify their views regarding the correlation of the coal beds on New River with those of Pennsylvania, through the evidence afforded by fossil plants, but such evidence would have been of little use had not the right man been there to make the interpretation.

David White stands today as one of the foremost paleobotanists of this country and one might almost say of the world. He has earned this supremacy by the most careful and painstaking work and by a knowledge of field conditions equalled by few men of the present day. The correct interpretation of the coal beds of the Appalachian region as well as the entire coal fields of the Mississippi Valley depends largely upon his work. By many persons this may seem to have little practical value, but coal operators are beginning to realize that it is of the utmost importance for them to know what coal bed they are working and to be able to say with certainty whether or not it extends into the next ravine, the next valley, or the next county.

Charles David White was born in Palmyra, N. Y., July 1, 1862. He was graduated from Cornell University in 1886. He was Assistant Paleontologist of the United States Geological Survey from 1886 to 1894. He served the Survey from 1894 to 1900 as Assistant Geologist, and in the later year was raised to the rank of Geologist. Mr. White was made Chief Geologist November 16, 1912.

SENATOR SHEPPARD ASKS THAT LIGNITE POSSIBILITIES BE PROBED

"Greatly increased prices for petroleum products and for many chemicals necessary to the industries of the country, as well as higher prices for all fuels, demonstrate the need of investigations to ascertain how vast resources of lignite, now lying idle, may be efficiently and economically used," says Senator Morris Sheppard in explaining his amendment asking for an investigation of lignite.

"Vast regions in the West and Southwest contain little or not petroleum and little good bituminous coal. There are, however, enormous resources of 'black lignite' and lignite in the Dakotas, Montana, Wyoming, Colorado, Utah, New Mexico, and Texas. These lignitic coals tend to slack on exposure, and to heat and take fire spontaneously when stored, and contain, as mined, considerable water, which reduces their fuel value.

"For railroad purposes these coals are objectionable because they break into fine fragments on the grate, with the result that there is a loss of unburned coal, and sparks blown out of the stack set fire to crops, forests, and dwellings. Present uses are for stationary boiler plants, where better fuel can not be obtained, cheaply and for domestic fuel, though some of the finer lignite coal is used

in reverberatory furnaces at smelting plants.

"In certain European countries, especially Germany, the amount of lignite mined nearly equals that of bituminous coal. There the lignite is largely briquetted, and the briquets sell at nearly the same prices as briquets of bituminous coal.

"Experiments made in this country have shown that certain lignites can be made into satisfactory briquets without the use of tar or other binding material, but in briquetting other lignite coals the use of a binder is necessary. The Government now has at the experiment station of the Bureau of Mines at Pittsburgh a large German briquetting press. This briquetting machine should be used for tests at some point in the lignite fields so as to reduce to a minimum the cost of transportation of the lignite tested. Further, experiments should be conducted to determine the nature and yield of volatile compounds to be obtained by distilling lignite and the possibility of using the residue from distillation as solid fuel.

"The distillation experiments would show what method of distillation and what products would yield maximum returns. These experiments should be thorough and include all possible combinations of conditions favorable to the formation of the products desired. Very little systematic scientific investigation of the distillation products to be obtained from the different lignites in the West and Southwest has been done.

"The products to be obtained may include benzol, which can be used as a substitute for gasoline in internal combustion engines or in the manufacture of a great variety of products, including dyestuffs; ammonia compounds, which can be used in the manufacture of fertilizers; and tars and pitches that can be used for a wide variety of purposes, including roofing materials, road improvement, and as binding material for fuel briquets.

"The residue left after volatile compounds have been distilled from the lignite could undoubtedly be converted into excellent smokeless fuel.

"In view of the extent of the lignite coal resources now little utilized, it is believed that the appropriation asked for the conduct of these experiments will not only prove of direct advantage to the people of the West, but will advance the industrial preparedness of the nation.

PLAINS IRON WORKS TAKES OVER F. M. DAVIS CONCERN

The F. M. Davis Iron Works Co., of Denver, has been sold to The Plains Iron Works Co., a new organization, which takes over the business established many years ago by the late F. M. Davis.

R. B. McConney will continue as general manager, a position held by him for several years.

WEST MUST BE CONSTRUCTIVE IN CRITICIZING LEASING LEGISLATION, SAYS STEARNS

Denver Manufacturer Submits Suggestions for Law That Might Meet With Approval of People in Public Land States—Declares Present Water Power Legislation Is Foolish

L. T. B. Stearns of the Stearns-Roger Manufacturing Company, of 1718-1720 California Street, Denver, writes J. F. Callbreath, secretary of the American Mining Congress, as follows:

"I read the article on page 186 of the April MINING CONGRESS JOURNAL; and it is good. I assume you wrote it.

"My ideas are somewhat indefinite on this proposition, but I appreciate the request you make is necessary.

"We of the West who oppose the present proposed leasing system, should substitute some constructive leaseure. It is easy enough to knock down, and object, and oppose. Briefly, I would suggest:

"1. That the information in the possession of the Government be tabulated, and that all of these public lands be valued on a reasonable basis.

"2. That they be thrown open to permanent entry, provided people are willing to pay the price asked by the Government.

"3. That suitable laws, following the natural method of development of the various kinds of mineral deposits, be framed, which will be clear and distinct; and for that purpose the different deposits should be classified. For instance, the placer law that exists today is not quite applicable to the development of oil and gas.

"I would suggest that locations be permitted to be filed in the regular way, and that these locations be allowed to remain in the possession of the locator for a reasonable length of time, say, one year. This would give the party possession while drilling, and if discoveries be made, then the party be allowed to go ahead and patent, and the Government charge the party the price per acre which had been previously established on this particular land, as suggested under heading (1) hereinabove.

"At the end of the period (of one year, or whatever may be decided), if no discoveries be made, or no work be prosecuted, then the locator should abandon his right, let it revert to the Government, and lie open for a successor.

"I would frame this development law differently for coal, for phosphates, and so on. In the case of mineral claims, I would stop the old apex law completely, and go back to the vertical plane boundary plan, the same as they have in Australia, Mexico and other places.

"I would have the locators remain in possession for prospecting purposes, in the same manner as in the oil, land, say, for a year, and then put a fixed price, as suggested hereinabove under (1) per acre on this land.

"I would also restrict so that no one person or one company could take more than a certain acreage of mineral location.

"These are general suggestions. I could of course go on particularizing for a long time, but this gives you my general notion how this matter should be framed up. Whatever should be done should look towards ultimate ownership by the individual, as no form of leasing can be devised which will overcome the objections which have been justly raised against the present bills by the western people. No Federal Government should be a landlord. The land should be opened to entry and establish citizenship in the State.

"Take the proposed legislation *re* water power. How foolish it is. Every encouragement should be given to the development of water power, and I think the present laws for location, filing water rights, etc., are good. But in addition there should be compulsion on the part of the Federal Government to permit anyone wanting to develop water power to take a right of way through forest reserves or other withdrawn lands. It should not be a question of permission, but should of a question of the *right* of the locator.

"I think every inducement should be held out for the development of these powers, because nothing is lost, and everything is gained."

CONTINUE FIGHT ON LEASING

BILLS SAYS J. F. MCCARTHY

With regard to the leasing bills and the editorial on the subject which appeared in the April JOURNAL, James F. McCarthy, of Hecla Mining Company, of Wallace, Utah, says:

"I have read with much interest the editorial in the current issue of the MINING CONGRESS JOURNAL entitled, "Leasing Bills."

"The article expresses the situation concisely. The West is opposed to the bills and offers nothing in their place. The passing of these bills, however, is, in the opinion of Westerners at least, so unfair that they should be defeated if possible. Let matters stand as they are if necessary until such time as

there is a crystallization of opinion on the subject, which takes western opinion and western interests into consideration.

"Resistance may be useless. If the bills are finally passed in the face of the opposition of the states directly interested and if the representatives of those states watch jealously the effect of the operation of such laws then if the laws are as bad as we think they will be, repeal might be easy.

"I do not believe, however, that we should withdraw our resistance as long as we think the proposed laws are bad.

Sees Beyond the Bills

Geo. E. Collins, a nationally known mining engineer, with headquarters at Denver, says:

"My impression is that the crux of the matter is not so much the bills themselves, as the spirit which now dominates Congress and the Government bureaus which will apply them. I think the development of the West might be conducted on a leasing system as well as on the basis of ownership, if it were planned and administered solely with a view to the speedy and efficient development of the national resources. The trouble is that the people of the eastern States, having already reaped all possible benefit from the disposal of the public lands within their own borders, now regard the residuum of the federal lands in a different light, and desire that they should be reserved for the benefit of the nation as a whole. That would have been fair and just enough, had we started out in that direction at first. Now it merely means that the West should pay tribute to the East.

"If Congress is willing to make it clear that royalties under a leasing system shall be limited to such a basis as will cover the cost of administration, most of the objection will fall to the ground. So long as it is the intention to extract revenue from the development of the West, I think western men should oppose the leasing bills."

READERS TELL OF BENEFITS

FROM MINING CONGRESS JOURNAL

A considerable number of letters are being received from readers of the MINING CONGRESS JOURNAL, in which they are kind enough to express their appreciation for the service which the American Mining Congress is attempting to render through its official publication.

The JOURNAL is now well along in its second year and has developed the fact that a great deal of very useful information was not reaching operators of mines previous to its advent.

Extracts from some of the communications that have been received, apparently bear out the conclusion that the MINING CONGRESS JOURNAL is being appreciated by those who read it. An excerpt from one of them is as follows:

"I am very much surprised, after having

read your publication for several months, to note how intimately the mining operator is interested in matters which transpire in Washington. I am impressed with the efforts that the Congress is making to further the mining industry and I quite agree with the JOURNAL's editorial stand that so much good has been done by the comparatively small appropriations allowed mining by Congress that considerable additions should be made to the funds allotted to this work."

A caller at the office of the Mining Congress recently declared that his periodical visits to Washington are becoming necessary less frequently, due to the fact that the MINING CONGRESS JOURNAL keeps him well abreast with matters in Washington. Previously it had been necessary for him to visit the Capital frequently to ascertain the status of various matters in which he is especially interested.

A rather enthusiastic member, writing from the far West, says:

"It never occurred to me, so forcibly until reading your journal just how much more the farmer is getting out of the government than is the mining man. I am sure that there is no one to blame for this condition but ourselves. The mining men of the United States should get together and whoop it up until Congress will have to give attention to us and the billions of new wealth we are creating every year."

An operator of a large coal mine presents the following view:

"I am glad to see you people giving publicity to the fact that there are no 'coal barons.' More than furnishing coal operators with much valuable information with regard to traffic matters, information from the statistical department of the Geological Survey and the month to month development of the coal work being conducted by the Bureau of Mines, you are in position to do splendid work in calling attention to the fact that the coal mine operator is not in such a heinous class that he always should be legislated against."

A man from Utah says:

"Please let nothing slacken your activity in bringing home to Members of Congress from other than mining states that we need a general revision of the mining laws and need it badly. Our Congressmen help to pass legislation that is beneficial to other sections of the country. Why should eastern Representatives oppose legislation that concerns us only, and on which we are practically unanimous? I read with great interest in your journal an account of the hearings of Mr. Taylor's bill asking that a commission investigate the exact changes in the law which are necessary."

Tungsten Used as an Alloy

Some saw steels contain as high as two per cent of tungsten. Valves for high-powered automobiles are sometimes made from an iron tungsten alloy. Some stellite intended to replace tool steels contains several per cent of tungsten, and the alloys known as minargent, platinoid, partinium and sideraphilt are said to contain tungsten.

DR. PARSONS DEPLORES**WASTE IN COKE MAKING**

Wastes in the manufacture of coke in the United States were condemned by Dr. Charles L. Parsons, chief of the division of mining technology of the Bureau of Mines, in a recent hearing before the Ways and Means Committee of the House of Representatives. Dr. Parsons' statement is as follows:

"The Bureau of Mines has long been interested in the development of a by-product coke industry on account of the tremendous wastes of valuable material that are annually taking place. This ruthless waste of material valuable to the farmers of the country for agricultural purposes, to the manufacturers of the country for power, and to the whole Nation as a source of products which might be used in time of war for explosives and in time of peace for a dyestuff industry was pointed out by the bureau in 1912. The figures given there for the year 1910 showed that 63,000,000 tons of coal containing \$22,000,000 worth of recoverable nitrogen were converted into coke; but only about one-sixth of this coal was treated in by-product ovens or retorts which could make the recovery of the nitrogen possible. J. D. Pennock has shown that between 1893, when the first by-product coke oven was built in this country, and 1910, the coke coked in beehive ovens, where the volatile nitrogen was ruthlessly wasted in fire, amounted to about 810,000,000 tons. Had this been coked in by-product ovens the volatile nitrogen of the coal would have yielded twenty-three pounds of ammonium sulphate per ton, or a total of 9,315,000 tons, which, at \$60 per ton, would have had a value of \$558,900,000. But this would not be all. Had this ammonia been recovered, it would have been used on the soil as a fertilizer, and the crops would have been increased fully 20 per cent and the saving would have been many millions more."

"Mr. E. W. Parker has shown that the value of the recoverable contents of the coal made into coke in beehive ovens which was wasted in 1910 would have been between \$35,000,000 and \$40,000,000. If all the coke made in the United States were produced in retort ovens these would yield from the carbon now wastefully consumed, no account being taken of by-products, approximately 1,000,000 horsepower."

"It is through this use of by-product ovens that Germany has obtained the basis of both a high-explosive industry and a dyestuff industry. Through by-product ovens are obtained and recovered large quantities of ammonium compounds, which, on the one hand, are used in times of peace for agricultural purposes, and in time of war may be oxidized into nitric acid—the basic and absolutely essential chemical for the production of all of the prominent explosives used in warfare. It is chiefly from ammonia obtained from by-product coke that Germany is now procuring her nitrogen compounds by the oxida-

tion of ammonia. Furthermore, the by-product coke industry yields large quantities of coal tar, which furnishes benzol and toluol used for the basis of most dyestuffs and a basis for the high explosives used in shells, torpedoes, and the like, as well as the naphthalene, anthracene, and most of the other compounds going into the dyestuff industry. In 1910 Germany treated about five-sixth of her coke in by-product ovens, while the United States treated only approximately one-sixth, and these figures are in a sense a measure of the degree to which the resources of each country have been developed for the production of explosives and dyestuffs."

"Since 1910 there has been a decided growth in the by-product coke industry in this country. Many by-product coke ovens have been built, and today approximately one-third of the coke produced in America is produced in by-product ovens, showing in five years an increase of something like 100 per cent. Since the foreign war began the by-product industry has received great impetus, as is naturally to be expected, and ammonium sulphate, benzol, toluol, coke, and gas from coal have been turned out in increasing quantities. It is of the utmost importance to the country that this industry shall be maintained and developed when the present war is over."

"As has already been stated, the explosive industry and the dyestuff industry are intimately connected. The same basic products are used in both. Essentially the same basic chemicals, such as sulphuric acid, nitric acid, chlorine, bromine, acetone, and many others are required in both industries. Accordingly, the chemical industry of the country is as intimately associated with a dyestuff industry and is as intimately dependent for its future upon a dyestuff industry as it is upon the explosive industry."

"The great difficulty which the ammunition plants of this country have had to meet during the past year in order to supply the demands made upon them has been the procuring of sufficient sulphuric acid and nitric acid to carry on their work. It is at present even more difficult to secure necessary supplies of these two acids than it is to supply benzol and toluol. However, the heavy chemical industry of the country has greatly expanded in response to the demands upon it, and probably at least 1,000,000 tons more of sulphuric acid was made in this country in 1915 than in the previous year. The production of nitric acid has also increased to a previously undreamed of figure."

"The basis of nitric acid in this country is now solely the sodium nitrate known as Chile saltpeter, imported from Chile. The ammonia obtained from ammonium sulphate can now be commercially oxidized to nitric acid, and the ammonia produced in the by-product coke works would help to supply a large amount of this absolutely essential chemical if for any reason the Chile deposits should be no longer available."

"Since the explosive and dyestuff plants re-

quire essentially the same raw material, the same chemicals, and to a large extent the same apparatus for sulphation and nitration, it is a simple matter to convert any dyestuff plant into a foundation for an explosive industry such as we have at present largely developed in this country, and, conversely, an explosives industry can be turned with comparative ease into a dyestuff industry, if the price of dyestuffs is sufficient to warrant the change. The dependence of the textile industry on a home dyestuff industry has already been pointed out and need not be enlarged upon by me.

"All of these industries with the exception of the textile industry are now on a boom basis, and it is my opinion that this committee should carefully view the future. When the war is over, the output of explosives will of necessity decrease to a small fraction of the present figures. With a decrease in the explosives industry will come a corresponding decrease in the manufacture of sulphuric acid, nitric acid, chlorine, and other prominent chemicals so that a depression in the chemical industry is sure to result unless some outlet is obtained for the increased production of these chemicals incident to the present commercial conditions. A dyestuff industry appears to be the only possible outlet for the product of the chemical industries and for the apparatus and plants of the explosives industry. Unless this outlet is in some way provided, a depression in industry and a decrease in the demand for labor is sure to result. If dyestuffs are not provided before the war is over in quantity sufficient for the textile industry, it has already been pointed out that a depression in the textile industry will result even sooner.

"The plants now being built in the explosives industry, in the dyestuff industry, and, to a certain extent, in the heavy chemical industry are being erected with the idea that they will be "scrapped" as soon as the war is over. To my knowledge the estimates on the installation of most new undertakings is based on an amortization of the plant within six months or one year, in order that the plant may be paid for and scrapped when the war is over. The building up of an industry or industries on the basis of scrapping the plants shows of necessity present boom conditions to be followed unless some outlet is made with a corresponding depression.

"Accordingly, gentlemen, I feel very strongly that our national safety, our national efficiency, and our national prosperity are directly connected with some method being found by this Congress by which a dyestuff industry may be put on a permanent basis in the United States."

Frederick E. Burbidge, of Spokane, has been made general manager of the Federal Mining and Smelting Co., in Idaho.

DETAILED STUDY OF OATMAN DISTRICT BEING CONSIDERED

Attention of the Geological Survey has been called to several requests reaching the American Mining Congress, asking that a detailed examination be made of the Oatman District in Mohave County, Ariz.. In this connection Director George Otis Smith says:

"The Oatman District, in Mohave County, was described about seven years ago by F. C. Schrader in Bulletin 397. I fully realize that present activity in the district warrants a second and more detailed study, and plans for this work were considered some time ago.

"The first necessary step is the making of a good topographic map; but inasmuch as all of the funds available for topographic work had already been allotted last summer when the survey of the district was under consideration, it was impossible to begin the mapping under the appropriation for the present fiscal year. An allotment of funds for an accurate topographic survey of the Oatman District will be given careful thought when plans for the coming season are being considered, and a geologist will be detailed to study the district as soon as possible after the map becomes available.

"It of course should be realized that a detailed study of the district will require considerably more time than a rapid reconnaissance examination, such as was made some years ago.

JEFFREY COMPANY INSTALLS CONTRACTORS' PLANT DEPARTMENT

The Jeffrey Manufacturing Company, of Columbus, Ohio, has recently organized a new Contractors' Plant Department to handle the sale of a line of small rock and ore crushers, with which it will furnish its well known line of elevators, conveyers and screens. The company will specialize in the manufacture of small crushers only, which will fit in with certain well established Jeffrey lines such as pulverizers, loaders and sand and gravel machinery. These machines have been developed and are particularly adapted for use in the following fields: Road building, contracting, mining, rock crushing, in connection with pulverizers, in gravel plants, and in block and tile plants.

Leroy A. Kling, formerly sales manager of the Road Machinery and Limestone Crusher Department of the Wheeling Mold and Foundry Company, Wheeling, W. Va., will be in charge of this department.

The company is interested in hearing from agents who are qualified to handle the sales of these products in their territory.

D. W. Brunton, who has been spending some time in the South, has returned to his home in Denver.

HOUSE COMMITTEE AND DELEGATE WICKERSHAM SCORED AT MINING CONVENTION

Northwest Operators Call Upon Congress to Name a Commission Forthwith to Make Recommendations as to Revision of Laws—Committee Did Wrongful Act, Says Resolution

A wrongful act was committed by the House Committee on Mines and Mining when it rejected the bill providing for a commission to recommend the changes needed in the mining laws, in the judgment of the Northwest Mining Convention, which was held in Spokane recently. Delegate Wickersham, of Alaska, was scored for the part he took in defeating this legislation. Extensive resolutions covering the revision of mining laws question were adopted by the convention. They read as follows:

Whereas, The mineral land laws of the United States and Alaska, framed nearly 50 years ago, are unsuited to present needs and have developed various evils and radical defects that seriously retard or wholly prevent the development of our mineral resources, and

Whereas, In consequence of this recognized failure of present United States mining laws adequately to meet present requirements, there is everywhere among mining men a pronounced and growing dissatisfaction, and

Whereas, Owing to the thoroughness with which our older mining districts, have been surface-prospected, the discovery of the new, valuable and usually, more or less deep-seated mineral deposits is daily growing more difficult, and

Whereas, Those States that have endeavored to correct certain of the defects in the said United States mining laws have found that patchwork legislation is impracticable and that nothing constructive and permanent can be done effectively without Congressional authority, and

Whereas, Many unsuccessful attempts have been made in the past to interest Congress in this most important matter of mining law revision, now, therefore, be it

Resolved, By the 1916 Northwest Mining Convention, assembled at Spokane, Washington, that it is the conviction of this representative body of Northwest mining men that any further delay upon the part of Congress to take definite action in regard to an expert and comprehensive revision of the United States mining law must inevitably work great hardship upon the mining industry as a whole and may even threaten its future. Consequently, the convention hereby petitions that this Sixty-fourth Session of Congress appoint forthwith a mining law commission of not less than five prominent persons closely and actively identified with the mining industry and thoroughly competent to take evidence in the principal mining centers of the United States

and Alaska over a period of not less than one year, and afterwards to work out, for presentation to the next session of Congress, an harmonious and thoroughly coordinated code of mining law that shall best serve and safeguard the present and future interests of all concerned.

Resolved, That it is the sense of this convention that the said commission should consist of at least one business man, one mine operator, one mining engineer and two mining lawyers, each of acknowledged ability and sound judgment; also that the members of this commission should receive such adequate compensation for their services as would justify them in devoting their entire time and energies to a solution of the numerous problems involved.

Resolved, That it is the conviction of this convention that this revision of United States mining law cannot be accomplished successfully in any other manner than in that specified above, namely, by means of a duly accredited commission, and, therefore, that the House Committee on Mines and Mining did a wrongful act in rejecting the bill providing for a commission to study and recommend such revision and that any bill arising within said House Committee on Mines and Mining will necessarily prove wholly inadequate and even more detrimental to the mining industry than are the present mining laws.

Resolved, That it is the conviction of this convention that the House Committee on Mines and Mining erred at its hearing on January 5, 1916, and thereafter, in permitting itself to be swayed by the arguments of the Hon. James Wickersham, delegate from Alaska, whose challenges of the personal motives of the distinguished petitioners appearing before the committee, as representatives of the mining men of the so-called metalliferous States, this convention believes to have been unfounded and unjust.

Vanadinite Crystals Hexagonal

Vanadinite crystals of any color are six-sided, most of them terminating in a point. Some, however, especially the larger ones, may be incomplete, but some angles will be found showing the characteristic 120 degrees between sides. Crocoite crystals are all red and do not have the six-sided form. They are more likely to be four-sided with furrows running along the sides. Although four-sided they are not likely to be square.

**DR. SMITH WOULD APPLY
SHERMAN LAW TO CONDUCT
OF PUBLIC BUSINESS**

"The Coast and Geodetic Survey and the Geological Survey have much in common; the field of endeavor for each is nation wide; they are scientific in spirit and civil in organization; both are primarily field services, and the product of most of the work of each reaches the public in the form of maps," said Dr. Geo. Otis Smith in an address at the centennial exercises of the Coast and Geodetic Survey, last month. "The similarity in official names also indicates a certain overlapping of function, which, under some conditions, might cause duplication of work, but the gratifying fact is that the two Surveys have worked in the cause of American science on a coordinated rather than a competitive basis.

"Members of the Geological Survey most familiar with these large contributions have estimated that the value of the geodetic work done by the Coast and Geodetic Survey that would otherwise necessarily have been done by the Geological Survey has aggregated not less than a million dollars, and if the future work as now planned is carried to completion another million dollars will be included in the Geological Survey's total indebtedness to its elder sister.

"With full opportunity to overlap their fields of operation, to duplicate work, and thus to waste public money, there has been economical coordination rather than wasteful competition.

"In these days, when as American citizens we have so deep concern in the question of public regulation of private business, it may be opportune for some of us as public officials to pause and consider the question of regulation of public business. Do we apply the same rule to our conduct of the business of these federal bureaus that we advocate for the control of corporations? Here at the federal capital we have some two score scientific bureaus distributed through several executive departments. There exists no general plan or division of duties among these different agencies for public service, but as a fundamental policy we have pinned our faith to a sort of declaration of independence that all scientific bureaus were created free and equal, with the inevitable result that some fields of scientific investigation are occupied by two or more bureaus, other and less attractive fields shunned, and even others perhaps claimed by those not best qualified to make the largest use of the opportunity for work. This is the competitive system almost at its worst, because it is countenanced by men of scientific training and high ideals of public service.

"But first of all, we must agree that, however great its advantage as a method of stimulating progress, competition must be fair. If we are to apply the principles of the Sherman Act and the Clayton law to public business, unfair methods must be ruled out as illegal. Unrestrained competition in the pub-

lic service presents some dangers, no less real than those incident to unregulated competition in private business.

"Even at its best, however, this competition system is wasteful. The public has too often found that competition as the safety valve of business costs too much in steam. If, in the branch of public business in which we are engaged, the ideal is to render the best service at the lowest cost, must there not be regulation, and regulation which recognizes that there are what we may term natural monopolies in the Government scientific service? The adoption of the monopoly system, however, involves here, as in the field of public utilities, the correlative idea of adequate regulation in the public interest.

"The possession by any bureau of even a skeleton organization of efficient specialists in a certain field would seem to be the practically unanswerable argument for entrusting to that bureau any new and enlarged work in that field whenever Congress deems larger appropriations advisable. That is the type of practical logic that is recognized in private business, for under public regulation of natural monopoly the public utility company that first enters the local field is recognized and even protected by the public service commission, as long as the service rendered is at all adequate.

"In this informal comparison of the actual and ideal in the administration of the scientific bureaus of the Government, I have had ever in mind the existence of a real basis for optimism in the splendid record of the Coast and Geodetic Survey and the Geological Survey in absolutely coordinating their endeavors in the public service."

**GEOLOGICAL SURVEY DOING
WORK IN THIRTY-SIX STATES**

As showing the scope of current geologic work in the United States, the Geological Survey March report for the Division of Geology shows that investigations in progress during the month had directly to do with thirty-six states, and indirectly concerned Australia, Africa, the West Indies, the Cocos-Keeling Islands, Fanning Island, and the Canal Zone as well as Alaska, which last, of course, is a special field of investigation for a distinct division of the Survey. This extra work outside of the domain of the United States was incidental to the paleontologic and stratigraphic studies of the Survey specialists working on problems connected with the study of the Atlantic and Pacific Coasts.

During March six geologic reports were completed for publication by the Geological Survey as well as two scientific contributions for outside publications, while four manuscript classification reports on coal and oil lands were transmitted to the Land Classification Board in connection with the public land work of the Survey.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN



C. E. SIEBENTHAL
Geologist

C. E. Siebenthal, geologist of the U. S. Geological Survey, who is specializing on lead and zinc resources, and who has a wide acquaintance among mining men, was born in Vevay, Ind., April 16, 1869. His ancestors were members of the Swiss colony which came to Indiana in the early days and named the county where they settled Switzerland. As the colonists came from near the town of Vevey on Lake Geneva, Switzerland, they named the new town Vevay which name it bears to this day.

Mr. Siebenthal was educated in the public schools of that place and is a graduate of its high school. Following his graduation from high school, he attended the Indiana University. Dr. J. C. Branner, one of his instructors, became director of the Geological Survey of Arkansas, and young Siebenthal, along with a number of students from the University, did work on that Survey for several summers. Later they followed their professor to Stanford University where Mr. Siebenthal graduated, being president of the first class to go

out from the new university, and where he afterward obtained his A. M. degree. He was also a Fellow of the University of Chicago and while there did a piece of work which attracted attention, a series of relief maps of the Chicago area showing the different stages of the Pleistocene Lake, Chicago. Later he taught in the Manual Training High School at Indianapolis, and also served on the Indiana Geological Survey. In 1901 Mr. Siebenthal began his service with the United States Geological Survey and has since been with this organization.

Among the principal papers which he has had published are: "Geology of Dallas County, Arkansas," "Bedford Oolitic Limestone of Indiana,"* "Silver Creek Hydraulic Limestone of Southeastern Indiana," "Structural Features of the Joplin District," "Gypsum of the Uncompahgre Region, Colorado," "Gypsum of the Laramie Basin, Wyoming," "Bentonite of the Laramie Basin," "Notes on Glaciation in the Sangre de Cristo Range, Colorado," "Joplin District Folio,"* "Mineral Resources of Northeastern Oklahoma," "Tripoli Deposits Near Seneca, Mo.,"* "Geology and Mineral Resources of the Laramie Basin, Wyo.,"* "Geology and Water Resources of the San Luis Valley, Colorado,"* and "Laramie-Sherman Folio."* Bulletin 606, Origin of Zinc and Lead Deposits of the Joplin Region, which has recently appeared, is the result of twelve years of intermittent field and office study of the conditions of ore deposition in the most important zinc field in the United States.

Molybdenum Widely Distributed

In general it may be stated that molybdenite is found where there are large masses of granitic rocks, though it is found in small quantity with other rocks, according to the U. S. Geological Survey. This, therefore, confines the deposits mostly to what are known as the mining States; that is, the States of the Rocky Mountains and westward. It is also found in Maine and other States which have, as stated, large areas of granitic rocks. It would be impossible to state what the percentage of the molybdenite is in the rocks in which it occurs. It may vary in all proportions from the merest trace to considerable pieces of almost solid molybdenite. Wulfenite (the lead molybdate) is found only in the oxidized portions of lead-bearing deposits. The value is uncertain and is usually a matter of bargaining between buyer and seller. The latest actual offer of which the Survey knows is \$1 per pound for MoS_2 (molybdenum sulphide) in ore containing fifty per cent or more of the mineral, with a premium for richer ore and a reduction for poorer material.

*Co-author.

BY-PRODUCT COKE OVENS BEING INSTALLED RAPIDLY

Arrangements are being made to erect more than 500 by-product coke ovens in this country, according to the *Wall Street Journal*. In connection with this announcement that paper carries a concise account of the status of by-product development. The article reads as follows:

Manufacture of by-product coke was first begun in 1893 in a battery of twelve ovens built by the Smet-Solvay Co. at Syracuse, N. Y., and in that year 12,850 net tons of coke were produced. Today there are in existence, 1,689 Solvay ovens with an estimated maximum productive capacity of 32,035,400 tons yearly; 2,287 Koppers' ovens, productive capacity of 44,599,500 tons; 2,510 Otto ovens, productive capacity of 48,945,000 tons and 382 miscellaneous ovens with productive capacity of 6,489,000 tons, a total of 6,868 ovens, with an estimated productive capacity of 132,068,900 tons a year or 11,005,825 tons a month.

Arrangements have already been completed to increase the total number of ovens to nearly 7,400 and the productive capacity by more than 3,600,000 tons annually. The following ovens are in process of construction or will be started in the near future: A Solvay oven at Buffalo; a Roberts' oven at Canal Dover; a battery of Koppers' ovens at Birmingham by the Yolande Coal & Coke Co., and a battery of Roberts' ovens at Granite City, East St. Louis. In addition it is said steel interests contemplate putting up two batteries of by-products ovens on the south shore of Lake Michigan, in the neighborhood of Indiana Harbor and Gary.

The Peoples Gas Co. of Chicago is also said to be contemplating the building of a large battery of ovens in Chicago. It has been practically decided to put up the largest by-product coke oven in the world at Clairton, Pa., which is in the heart of the Connellsville field. This of course will increase the potential productive capacity of by-product ovens tremendously and accordingly will increase the consumption of coal.

There are many reasons responsible for the remarkable growth of the by-product coke industry. Chief among these is the large saving effected by reducing the gases driven from the coal during the process of coke manufacture, which cannot be recovered from bee-hive ovens. About one-quarter of the coal is driven off in the form of gases which when distilled yield heating gas, illuminating gas, tar, coal-tar products, dyestuffs, ammonium sulphate, benzol, etc., etc. It is safe to assume that the perfection by American chemists of a process for the manufacture of dyestuffs from coal tar products will place the United States in a position to surpass Germany in the world's color markets. Taking, for example, Connellsville coal, which contains 62.5 per cent fixed carbon and 28.36 per cent of volatile matter, besides yielding in the by-product process 75 per cent of its

weight in coke, one ton will give 10,000 cubic feet of gas, 5 gallons of tar, 20 to 25 pounds of ammonium sulphate and 1.1 to 3.8 gallons of benzol.

The value of these products is considerably in excess of \$1.50 per ton of coal used, but using \$1.50 as a minimum value, operating at maximum productive capacity, and using 203,504,856 tons of coal annually the by-product coke ovens of this country would have \$305,257,284 annually, which would be totally lost in the bee-hive process. Were the use of the by-product oven exclusive, this saving would amount to more than \$1,000,000,000 a year.

In 1914 more than 51,500,000 tons of coal were used in the manufacture of coke. The by-products from this coal represented, on a basis of \$1.50 per ton of coal used, almost \$80,000,000.

Comparing the bee-hive oven with the by-product oven, every advantage seems to be with the latter. The by-product ovens are permanent, whereas the bee-hive ovens are usually temporary, the former may be built in any location where the rate for the transportation of coal is not prohibitive, whereas the latter are invariably built at the coal mines and have to be abandoned when the supply of coal gives out. Chemists are discovering more and more valuable products which are recoverable from coal tar gases and economical processes for the distillation of the gases and the recovery of these products are constantly being devised. In fact, the by-product industry promises to be the more profitable part of the coke industry. Steel mills and blast furnaces are realizing the value of the by-product oven, and the marvelous growth of the industry has been the result.

ISSUES COMPREHENSIVE REPORT ON ALASKAN MINES

The report of William Maloney, territorial mine inspector for Alaska, crowds into thirty-six pages a remarkable amount of information regarding mines and mining in Alaska.

Some copies of the report are being circulated by the Bureau of Mines and are attracting much interest in Washington.

During 1915 Mr. Maloney inspected 168 placer mines, 31 quartz mines and 30 dredges. To do this it was necessary to visit the following mining districts: The Fairbanks, Hot Springs, Tolovana, Tenderfoot, Ruby, Iditarod, Seward Peninsula, Valdez, Seward and Juneau.

The report tells of the advance being made in safety work. It gives a detailed account of the accidents during the year. There were only twenty-three fatalities charged to mining in Alaska in 1915. The report contains a discussion on labor conditions and discusses briefly the status of the industry in the various mining camps in the Territory. Of particular value is the complete list of mining companies operating in Alaska.

FOREST SERVICE REGULATIONS REGARDING FIRE HELD PERFECTLY REASONABLE

Forestry Relations Committee of American Mining Congress Sends Out Instructive Circulars to Prospectors—No Permit Necessary to Prospect on Reserves—Timber May be Used for Development Work

With regard to prospecting on the forest reserves, the Mining Congress Committee having this subject in charge has issued the following statement:

"Broadly speaking, the rules relating to prospecting for mineral on forest reserves are just the same as on any public land. The occasion for any difference between the Forest Service and the prospector is usually the result of the fact that, because the Forest Service covers its territory with the rangers, the land laws are enforced, while on public domain there is no provision for doing this and in consequence their application has been very largely lost sight of.

"All mineral land, whether on forest reserves or on other unlocated land, is under the jurisdiction of the Secretary of the Interior, while the Forest Service comes under that of the Secretary of Agriculture. The part which the Forest Service takes in connection with mineral land is merely that of carrying out a courtesy of one department to another and because they have men on the ground who are available for the work. There is the advantage, however, that the Forest Service is presumed to and does go into all the facts and as far as possible adjust any differences. It is their purpose and intention to encourage development of any mineral land, in a great many cases because it is very desirable as a matter of fire protection to have the reserve occupied.

"In addition to this fact the act creating the forest reserve specifically states in the following language: . . . but it is not the purpose or intent of these provisions, or of the act providing for such reservations, to authorize the inclusion therein of lands more valuable for the mineral therein, or for agricultural purposes, than for forest purposes."

That the situation is fully realized is shown also by the following quotation from the act or its amendments:

"The Secretary of the Interior may permit, under regulations to be prescribed by him the use of timber and stone found upon such reservations, free of charge, by bona fide settlers, miners residents, and prospectors for mineral, for firewood, fencing, buildings, mining, prospecting, and other domestic purposes, as may be needed by such persons for such purposes; such timber to be used within the State or territory, respectively, where such reservations may be located."

"Nothing herein shall be construed as pro-

hibiting the egress or ingress of actual settlers residing within the boundaries of such reservations, or from crossing the same to and from their property or homes; and such wagon roads and other improvements may be constructed thereon as may be necessary to reach their homes and to utilize their property under such rules and regulations for all proper and lawful purposes, including that of prospecting, locating and developing the mineral resources thereof; *Provided*, That such persons comply with the rules and regulations covering such forest reservations."

"All waters on such reservations may be used for domestic, mining, milling, or irrigation purposes, under the laws of the State wherein such forest reservations are situated, or under the laws of the United States and the rules and regulations established thereunder."

"And any mineral lands in any forest reservation which have been or which may be shown to be such, and subject to entry under the existing mining laws of the United States and the rules and regulations applying thereto, shall continue to be subject to such location and entry, notwithstanding any provisions herein contained."

From "the Use Book" it will be very evident that the policy of the Forest Service is to give anyone who goes on the forest reserve in good faith every opportunity to carry on his work to very best advantage. They have, however, frequent cases to contend with where the rights are abused and the laws broken without any reason or excuse. The following is quoted from instructions to the executive portion of the Forest Service and no fair minded person can take exception to what is stated particularly when it is remembered that the work of the Forest Service is for the benefit of many thousand people, for every prospector that might reasonably be expected to go on the ground.

DEFINITION OF A VALID CLAIM

"A valid claim is one initiated in good faith under some act of Congress for the acquisition of title to public lands and continued by use consistent with the character of the claim and necessary for its actual development."

It is a fundamental requisite that all claims be initiated in good faith for the purpose contemplated by the law under which they are held. It is bad faith, for instance, to hold a mining or agricultural claim pri-

marily for the timber thereon or to acquire a site valuable for water power development. Where the land is held for the timber, for a hotel site, saloon site, or other foreign use, and there has been no compliance with the requirements of the law under which the claim was initiated, it may be considered prejudicial to National Forest interests."

EXAMINATION OF MINERAL CLAIMS

"Prospecting will not be interfered with and mineral locations will not be examined prior to application for mineral patent, except where a report is requested by the Department of the Interior or where locations interfere with the administration of the National Forest. No adverse report will be submitted to the Department of the Interior which has not been made by a mineral examiner. Prospecting may be carried on without obtaining a permit from forest officers.

FREE USE OF TIMBER

"The locator, or subsequent owner, of a mining claim has a right to the use of sufficient timber from his claim for development purposes. This includes the construction of such buildings as may be necessary as an adjunct to such development and the timber for shafts and tunnels, as well as for fuel in connection with such development. Timber, however, may not be cut from one claim to be used on another claim, even if it be of the same group, unless its use tends to develop the claim from which it is cut, as well as the one on which it is used, except under free-use permit."

"A mining claimant has no right whatever to cut or remove timber from his claim for sale or for purposes other than the development of the claim, and such removal constitutes trespass, except where the removal of the timber reasonably in advance of the mining work is necessary to the development of the claim."

The law regarding the use of timber for mining purposes on any public lands states that it may be cut only from the included surface, although this is something which received very little attention from the mining public and frequently is a matter of surprise when this restriction is made on forest reserves. The quotation above, however, shows how very easy this question can be arranged when the claim is taken up where timber is unsuitable or scarce and all that is necessary is to consult the local ranger who will advise what timber may be cut. Service Regulations S 27 and S 29 quoted herewith will show how well this matter is taken care of.

REGULATION S 27

"Free use may be granted: (1) To bona fide settlers, miners, residents, and prospectors for minerals, for firewood, fencing, building, mining prospecting, and other domestic purposes; (2) to school and road districts, churches, or noncommercial cooperative organizations of settlers for improvements of

mutual or public benefit; (3) for the construction of telephone lines when necessary for the protection of National Forests from fire; (4) to certain branches of the Federal Government."

REGULATION S 29

"Permits will be required for green material."

Free-Use Areas: "Supervisors may, with the approval of the district forester, designate as free-use areas portions or all of any National Forest, and settlers, miners, residents, and prospectors for minerals may cut and remove from such areas, free of charge and without permit, under such rules as may be prescribed by forest officers, any dead timber needed for their own use for firewood, fencing, buildings, mining prospecting and other domestic purposes. No timber may be taken under this regulation for sale to other persons or for commercial use."

Emergency Use: "Material may be cut outside of a free-use area without permit in cases of emergency or of immediate need. The person taking such material shall promptly notify the forest officer in charge of the district."

Transient Use: "Small quantities of material needed by transients may be taken without permit."

Briefly stated, therefore, the situation is as follows:

No permit is required to prospect on Forest Reserves.

Timber on claims may be used freely for all necessary purposes in developing.

If additional timber is required the ranger should be consulted.

Forest Service Regulations regarding fire are perfectly reasonable and should be carefully observed.

The ranger has no option in his action in carrying out any rules prescribed and fire rules are of highest importance. In case of any uncertainty consult the ranger and if not satisfied the District Forester or write to the Secretary of the nearest Chapter of the American Mining Congress, or to the Forestry Relations Committee, 316 Colorado Building, Denver.

TUNGSTEN DEPOSITS IN U. S.

BEING DEVELOPED RAPIDLY

The U. S. Geological Survey knows of no new extensive deposits of tungsten ores that have been found in the United States. There are, however, many developments of known deposits from which an increased production is being made. In the Atolia, Cal., field the known deposits have been developed greatly and numerous extensions have been found. The ore from this area is scheelite, calcium tungstate. In Arizona many new deposits have been found but they have not to date been shown to be extraordinarily large.

OKLAHOMA COAL COSTS \$1.80 TO \$2.00 A TON TO PRODUCE, CARL SCHOLZ TESTIFIES

President of the American Mining Congress and Other Operators Appear Before the Indian Affairs Committee of the House and Explain Mining Conditions on Indian Lands—Alderson Best Domestic Coal in United States

The situation in the coal mines on Indian lands in Oklahoma was the subject of a hearing April 14 before the House Committee on Indian Affairs. Carl Scholz, president of the American Mining Congress; P. R. Allen, vice-president District 21, Southwestern Coal Operators; Frank Drew, secretary; James McConnell, James H. Hibben, and Dorset Carter, attended this hearing, extracts from which are as follows:

Mr. Scholz. The only thing I want to touch on is the last clause of the paper read by Mr. Carter in connection with the extension of the lease. As you yourselves well know, our company operates in the Hartshorne Basin, and about ten years ago, we abolished the method of mining from the crop, believing it was not for the best interest of the owners or anybody else. Just now, we have in course of completion two mines which will cost us in the neighborhood of \$250,000 each. I have taken, quite recently, the mining trustees over that property to show them the expense connected with the development of these new mines, and Mr. Willis expressed surprise at the substantial manner in which the work is being carried on. As you also know, since 1902, we have been unable to mine in Oklahoma by pick, with the result that coal has been greatly depreciated in value. That has been brought about as the result of our troubles with the miners. When we settled our troubles, that was in the contract with the miners, that we should not mine any more by pick.

Representative Carter. Mining by the pick—what do you mean?

PICK MINING EXPLAINED

Mr. Scholz. It is a process of mining which returns a very large percentage of lump coal, and a very small percentage of slack. In Oklahoma, especially since the development of oil and gas, the market for slack coal has been at a low price. Every bit of slack coal has been sold at \$1.50 less than the cost of production, with the result that the lump coal has been caused to bear the loss sustained by the small coal. The only methods we have to offset the work fundamentally done by the miners, is the adoption of electric coal mining machinery, which is very expensive, involving a large outlay.

Mr. Snyder. Why do you have to eliminate the use of the pick?

Mr. Scholz. It is a condition which we reluctantly accepted, but we were compelled to. Electric coal mining means the installation of power plants, which are, in themselves, very costly, and the use of mining machines entailing an expense of \$2,000 each. Each machine has an output of about 50 tons, which, with the amount of help employed, and the high-class labor, makes quite an expensive process. The cost of an electrically equipped mine is five times as great as it was contemplated to be when the mines were developed. Consequently, to develop these mines to the best interests of the owners, whoever they may be, every encouragement should be held out to the lessees to invest the greatest amount of money required to develop the lands on the best possible basis. If this is not done, and the properties are permitted to run down, when the present leases expire, you will have very little coal available.

I want to bring that feature to your special attention, because your own representatives have called attention to the conditions, realizing fully they could not go on indefinitely, expending money there, without being able to reimburse ourselves.

Mr. Snyder. Have you stated what is your production of coal now?

PRODUCE 4,000,000 TONS

Mr. Scholz. About 4,000,000 tons this year.

Representative Carter. Is that all you can sell?

Mr. Scholz. Yes, sir; the mines in Oklahoma are operated only spasmodically. They operated only 144 days this year out of a possible 250.

Representative Carter. We have all got the reports, but Mr. Campbell wants to know what you think about the valuable coal in the lands.

Mr. Carter. The fact is on our lands—and I have studied them, but have not studied other lands around there, because I have my eyes on nothing except what I have got—I do not place much confidence in that report. I know it is unreliable. You know, Mr. Carter, that the St. Louis and Galveston lease, how the government gives a very elaborate description of the coal that underlies that 1,420 acres, those boys went there and tried

it and went broke, and now we have got hold of it the other day in connection with the railroad, about a year ago—that same land—and we took a large steam shovel, much larger than any on the Panama Canal, and larger than anything else ever built of its kind, and we removed the earth, and have gotten down to the coal, and have dug it up. Now, you take the government report of the condition of that coal and compare it with the actual conditions, and there is a wonderful variance. That coal will run twelve inches thick and then drop to five feet.

Representative Carter. There has been a report that that coal was worth some \$90,000,000,000.

Mr. Carter. That is all wrong.

AN ERRONEOUS CONCLUSION

Mr. Scholz. I think it is only proper to inform Mr. Campbell as to how the estimate was arrived at. I was one of the witnesses called before the Senate Committee in 1906 to answer that question. It came about this way. One of the Senators had seen a report prepared by Mr. Joseph Taft on the coal deposits in the Indian Territory, which stated that each acre of land was underlaid with 5,000 tons of coal. This same Senator also saw a report prepared by the United States mine inspector of the Indian Territory, Mr. William Cameron, which read that the spot value of the coal was \$2 a ton, and so the deduction that the Senator drew from that was 5,000 multiplied by \$2 per ton gave \$10,000 an acre. He did not take into account the fact that, in the \$2, \$1.90 represented wages and two cents the profit of the operator.

Mr. Campbell. What is the value of your coal?

Mr. Scholz. I would like to give you the actual cost of our coal to produce. The production of coal in the Hartshorne field ran \$1.88 per ton last year. This year it was \$1.80. Last year our tonnage was reduced and the price went up. Our Alderson cost \$2 a ton. Our Hartshorne coal is inferior coal, compared with the Alderson coal. It is the best domestic coal produced in the United States, in my opinion.

Mr. Campbell. Mr. Scholz, you are a practical man, acquainted with the value of coal lands. What ought the Indians to get for the remainder of the coal they have, per acre?

Mr. Scholz. Mr. Campbell, that is a very difficult question to answer offhand, and one that I believe I am not competent to pass on offhand, but I should say that the price fixed by Mr. Cameron is not far off. The average he fixed is about \$38 per acre.

Representative Carter. For coal?

FIGURES TOO HIGH

Mr. Scholz. Yes, sir; I made an appraisal for the Senate Committee in 1906. If I remember correctly, my figures were about \$9,000,000. The record will speak for itself. It is Senate Document No. 390, and Mr. Cameron's appraisal was just a little higher than my

figures. I think he was \$2,000,000 above me, and I venture if Mr. Cameron were here to-day, and I had the privilege of going over the matter with him, I would bring him to my way of thinking, that his figures are higher than they should be.

Representative Carter. Mr. Cameron was a practical coal man?

Mr. Scholz. Yes, sir.

Representative Carter. And was in charge of mines for years before he became an inspector?

Mr. Scholz. Yes, sir.

Mr. Campbell. When these lands are offered for sale, I take it that some Senators and some Members of Congress and some newspapers and magazine writers and others will proclaim it generally that there is property worth anywhere from four to ninety billions of dollars that somebody probably is going to get at a great deal less than it is worth. You say that it is worth about \$38 per acre, and Mr. Cameron says it is worth about \$40 an acre?

Mr. Scholz. Somewhere in that neighborhood—between \$30 and \$40.

Mr. Campbell. You are an operator, and Mr. Cameron was mining inspector for the State of Oklahoma.

Mr. Scholz. For the United States Government.

Mr. Campbell. That land has all been appraised, has it not?

Mr. Scholz. Mr. Cameron appraised it and I made an appraisal of it myself. It is on file, and I would be glad to file copies of that.

Mr. Campbell. Your appraisals ran within \$2.00?

Mr. Scholz. I am not sure, but I think we were very close together.

Mr. Campbell. What was the basis of your appraisement?

EXPLAINING CALCULATION

Mr. Scholz. The basis which I fixed was the income which had been derived from royalties, and from which I took a part of the income and set aside as a sinking fund, and the other was taken as an interest charge. At that time, the Indian Territory mines produced about 3,000,000 tons of coal a year. At the rate of 8 cents a ton, the annual income was \$240,000. I took two cents of that 3,000,000 to be set aside as sinking fund of the property and 6 cents to pay the interest charge, because those two things you cannot get away from. Interest and taxes are sure to follow you, and while I am on the subject of taxes, that is one subject that has not been touched upon, namely, that in our experience in the State of Oklahoma, in charging out of revenue, taxes, we are facing a very dangerous situation, and one which concerns all of us, merely because we do not know what we will have to pay for the mineral rights.

The 5-foot veins will yield 4,000 tons per acre. If all this coal were recovered at the rate of 8 cents per ton, the total royalty will be \$320. At the most, only \$80 should be

charged against the value of the coal, and the remainder to interest. In other words, the value of the coal in the ground at the outside would be 2 cents per ton, and perhaps a great deal less. My experience since leads me to believe that my appraisal was too high, because of the increased tonnage upon which my estimate was based has not been realized. With the increased tonnage upon which my figures were based the owners would have lost money, for a period of ten years, or fifteen years, after the property was paid for. They were not able to get enough money to pay interest and set aside a sinking fund. In other words, they were establishing a deficit, and it required up to 1923 before that deficit would be wiped out and from that time and thereafter it would be a money-earning proposition. That was the basis of my appraisal, which I thought a very fair one.

LOSS IN ACREAGE

This, however, does not represent the purchase value of the coal because of the large amount of acreage purchased with a mine which is lost and further reduces the value which a purchaser can afford to pay per acre. The closer coal is located to the place of development, the more valuable it is, hence, coal remote from shaft locations is less valuable because of the length of time elapsing prior to its development.

The coal must also bear the extinguishing charge of the improvements because every ton of coal removed makes the mine that much less valuable. If the original tonnage available in a mine was 2,000,000 tons, and the plant to develop it costs \$200,000, it is necessary to set aside one cent as a sinking charge for the equipment, plus the interest thereon. These deductions further diminish the original valuation of the coal.

ELECTRIC FURNACES AT NIAGARA PRODUCE MANUFACTURED GRAPHITE

"The production of natural graphite in the United States in 1915 was approximately 19 per cent, by value, of the graphite imported," says Edson S. Bastin, of the Geological Survey. "In addition to natural graphite, this country produced a considerable amount of manufactured graphite in the electric furnaces at Niagara Falls. The imports came mainly from the island of Ceylon.

"As usual the greater part of the crystalline graphite was produced by New York, Pennsylvania, and Alabama. The production of these States was all of the variety known in the trade as 'flake' graphite that occurs as small flakes forming 5 to 10 per cent, by weight, of crystalline schists, from which it is separated by more or less complicated milling processes. In addition to this a small quantity of crystalline graphite, resembling in a general way the Ceylon graphite, was produced in Montana. As a result of increased production in all of these States but particularly in Alabama the quantity of crys-

talline graphite produced in 1915 exceeded that for any previous year," declares Mr. Bastin. "The number of producers of crystalline graphite were four in Alabama, one in Montana, three in New York, and two in Pennsylvania," Mr. Bastin finds.

"Amorphous graphite mined in this country is used locally for foundry facings and paint pigments, its production was not stimulated by the war and was considerably below that for 1914. There were three producers, located in Nevada, Rhode Island and Wisconsin.

"Graphite in large quantities is manufactured by the Acheson Graphite Co., at Niagara Falls, N. Y., which utilizes electric power generated at the Falls. During 1915 a large new building was erected exclusively for the manufacture of 'Gredag,' a mixture of grease and graphite used for lubricating purposes. In March, 1916 a new furnace house was in process of erection. When this is completed the company will have four furnace houses in Niagara Falls, N. Y., and one in Niagara Falls, Canada, accommodating in all about forty furnaces.

"The demand for graphite electrodes greatly increased during the year on account of the remarkable growth in certain electrochemical industries," Mr. Bastin has ascertained. "The extent of this growth is indicated by the statement made in the *Iron Age* recently that during 1915 the number of electric steel furnaces in operation in this country increased 78 per cent. It is interesting to note that the size of the graphite electrodes made at Niagara Falls ranges from a diameter of 1/16 of an inch to a diameter of 12 inches and a length of 77 inches.

"The bulk graphite produced by this company in 1915 was reported as 2,542 short tons valued at \$99,633. This represents only the graphite which would come into competition with natural graphite and does not include certain graphitized products that do not compete with natural graphite."

SUIT OVER COAL LANDS

IS WON BY GOVERNMENT

Justice Stafford, of the District of Columbia Supreme Court, has denied the application of Fred W. and Mae Handel, of Montana, for a mandamus to compel Secretary Lane, of the Interior Department, to issue to them a grant for certain coal lands in Montana on the payment of the price of \$20 per acre fixed by Congress. The petitioners noted an appeal to the Court of Appeals.

Acting Secretary of the Interior Jones made answer to the petition in the absence of Secretary Lane and pointed out that Congress had fixed merely the minimum price at which the lands might be bought and that the practice of the department has been to have such lands duly appraised and to require payment at the appraised valuation.

In this case, he said, the appraisal ranges from \$72 to \$80 per acre, and he declared he had no authority to issue a grant of \$20 per acre as tendered by the petitioners.

CHAS. A. DAVIS, OF BUREAU OF MINES, DIES SUDDENLY

Prof. Charles A. Davis, a member of the Bureau of Mines, widely known as a geologist and botanist and for his investigations of peat, died April 9 at his residence on Ontario Road, this city, after an illness of several weeks.

Prof. Davis was born at Portsmouth, N. H., September 29, 1861, the son of Louis Gilman and Cyrena Frances (Pierce) Davis. He studied at Bowdoin College from which he received the degree of Bachelor of Arts in 1886, and that of Master of Arts in 1889. He subsequently attended the Cornell School of Forestry for one semester. In 1905 he received the degree of Doctor of Philosophy from the University of Michigan.

Immediately after his graduation from Bowdoin College he became a teacher of science, first at Hyde Park (Illinois) High School, 1886-1896, and then as professor of biology and geology at Alma College, Alma, Mich., 1896-1900. He was an instructor in forestry at the University of Michigan, 1900-1905; curator of the herbarium at the same university, 1905-1908. While acting as a field agent of the Michigan Geological Survey, Prof. Davis, at the suggestion of Dr. Alfred Lane, the State geologist, gave especial attention to the peat deposits of the State, and in 1907, when the technologic branch of the United States Geological Survey began investigations of the origin and use of peat, Prof. Davis became a member of its staff as peat expert. He served in this capacity with the survey from 1907 to 1910, and with the Bureau of Mines, 1910-1912. He was appointed fuel technologist in the Bureau of Mines in 1912, and geologist in 1915.

Prof. Davis was a Fellow of the Geological Society of America and a member of the American Association for the Advancement of Science, Michigan Academy of Science, Washington Academy of Sciences, Washington Geological Society, Washington Botanical Society, Washington Biological Society, Association of American Geographers, National Geographic Society, Alpha Delta Phi (Bowdoin and Michigan chapters), Phi Beta Kappa, Cosmos Club, corresponding member New England Botanical Club.

The published works of Professor Davis include: Peat in Michigan, 1907; The uses of Peat for Fuel and Other Purposes (a bulletin of the Bureau of Mines), 1911, and numerous papers in reports, bulletins and scientific and technical journals.

He was editor of the journal of the American Peat Society from 1907.

As an investigator, Prof. Davis was respected among men of science for breadth of knowledge, keenness of observation, sound judgment, and great technical skill. He was recognized as the foremost American authority on peat, and gave his time unsparingly to aiding the development of the peat resources of this country. In studying the utilization

of peat he made himself familiar with the methods used in foreign countries in digging and drying peat, in using it for fuel under steam boilers or in gas producers, or for other purposes.

As fuel technologist and as geologist of the Bureau of Mines, Prof. Davis not only gave attention to practical questions of utilization, but studied the origin of peat, lignite and coal, and had begun an investigation of the origin of the oil shales of Colorado and Utah.

The purpose of this work was to determine the nature of the organic remains that yield petroleum when the shales are distilled, and thus to contribute to the utilization of these shales, which are of great prospective importance as sources of gasoline, lubricating oils, mineral waxes and ammonia compounds. In his microscopic studies of these shales and of peat and lignite, Prof. Davis developed original methods of cutting and preparing thin sections for microscopic study, and the high excellence of his skill in preparing and examining these sections is recognized by men of science in this country and abroad.

Prof. Davis endeared himself to his friends and scientific associates by his quiet, modest, and unassuming demeanor and his charity toward those who differed from him. He was loved as well as respected.

He is survived by his wife, Mrs. Frances M. H. Davis, of this city; his mother, Mrs. L. G. Davis, of Portsmouth, N. H.; his sisters, Mrs. Robert Sugden, of Portsmouth, N. H., and Mrs. Arthur W. F. Brown, of Fitchburg, Mass., and his brother, Mr. Percy Davis, of Waltham, Mass.

Interment was made at Portsmouth, N. H.

Canada Leads in Nickel Production

The world's supply of nickel ores in 1912, as estimated by the Metallgesellschaft of Frankfurt on the Main, was 28,500 metric tons, of which 20,300 were produced in Canada and shipped in the form of matte to be refined in the United States and England. Germany refined about 5,000 tons, of which a part was probably produced in that country and a part was imported. France refined 2,100 tons of nickel which was imported from New Caledonia. Other countries produced about 1,200 tons, probably, mostly from Norway.

Print New Bulletin

The E. I. du Pont de Nemours & Company of Wilmington, Del., have just had printed a Clay Blasting Booklet. As it is the first booklet ever issued on this subject it contains valuable and interesting information. Some of the phases covered are "Digging Clay," "Stripping," "Blasing Down Shale," "Digging Plastic Clays," "Mining Flint Clays," "Draining Clay Pits," as well as full information on the use of explosives.

**GOVERNMENT EXPERTS WELL
KNOWN TO MINING MEN**



H. G. FERGUSON
Geologist

H. G. Ferguson, a geologist of the United States Geological Survey, who has a wide acquaintanceship among mining men, was born in San Rafael, Cal. He began his education in the public schools in Hartford, Conn. Later he graduated from St. Paul's School at Concord, N. H., after which he attended Harvard. He was graduated in 1904 and took a Master of Arts degree in post-graduate work in 1906. In addition Mr. Ferguson spent the winter of 1911 at Yale.

The first work done by Mr. Ferguson after leaving school was in 1906 and 1907 with the Cleveland Cliffs Iron Company, Ishpeming, Mich. In 1907 he was appointed to a vacancy in the Philippine Bureau of Science. He served as geologist with this bureau until 1910. In this latter year Mr. Ferguson was sent as a delegate of the Philippine Government to the International Geological Congress at Stockholm, Sweden. On returning to the United States in 1911 Mr. Ferguson began work with the United States Geological Survey, and has continued with it since.

Various reports on Philippine geology and

gold mining in northern California have come from Mr. Ferguson's pen and he has a number of other works in process of printing or of preparation.

**FEDERAL TRADE COMMISSION
REGARDS UNIFORM ACCOUNTING
PLAN WITH FAVOR, IT SEEMS**

Active work is being done by the American Mining Congress Committee on Uniform Reports to Government Authorities.

The congress has had a committee working upon this subject for some little time, and this has led to the uniform system of accounting. An accurate system of cost accounting would prevent much of the price-cutting, which, for instance, is so prevalent in the bituminous coal industry.

A recent conference of the committee with the Federal Trade Commission, brought out a statement from one member of the commission, that full 90 per cent of the manufacturing concerns of this country have no knowledge of the exact cost of their production.

This is particularly true of the coal industry. Any system which would lead to a better system of cost accounting would be of service, not only to the companies which do not have such a system, but to other companies, because of the stabilization of prices on the part of competitors who, if they knew it, would not sell their production at less than its cost.

The Federal Trade Commission seems willing to give its approval and assistance in securing general approval of such a plan.

E. T. Brent advises Chairman S. A. Taylor, of the Committee on Uniform Accounting of the American Mining Congress, that the Franklin County (Illinois) operators have gone into the matter of a standard system of accounting in a painstaking manner. They have called in expert advice. Mr. Brent regards it as probable that the Franklin County operators will endorse the plan unanimously.

Cerium Has Various Uses

Cerium has been used to a small extent in the coloring of glass, to which certain salts are said to give a yellowish tint; as nitrate in the making of gas mantels, according to Sydney J. Johnstone. The Rare Earth Industry, London, Crosby, Lockwood & Son., 1915, pages 32 and 33, as cerous chloride, in dyeing, for weighting silks, as a mordant, in leather dyeing, a base for dye stuffs of the alizarin group, as catalysts in the manufacture of sulphuric acid, and as a sulphate in an electric accumulator. Thomas A. Edison has taken out a patent for the use of a cerium compound, probably oxide, in a storage battery (No. 1,167,485, January 11, 1916). These are the only uses, aside from that in pyrophoric alloys, of which the U. S. Geological Survey knows.

GOVERNMENT HAS VAST AMOUNT OF DATA ON TAP

An example of the painstaking care exerted by the government to see that all possible information is furnished to those who inquire is shown in a letter received recently by the Bureau of Education from a school teacher in a small town in Minnesota. The letter read as follows:

"Will you kindly send us material on the following subjects: Preparedness, Americanization of Immigrants, Water-power one of the Natural Resources, Peace, Evils of Child Labor, the Seven Wonders of the World Today (Wireless Telegraphy, Telephone, Radium, X-Ray, Spectrum Analysis, Aeroplane, Panama Canal)?"

It was necessary to refer this letter to the Geological Survey, Bureau of Mines, Department of Labor, Bureau of Standards, War Department, Smithsonian Institution and Panama Canal office.

Despite the sweeping nature of the request, the school teacher who made it will receive very comprehensive information as to each of the matters concerning which she inquired. The director of the Geological Survey, for instance, replied as follows:

"I am sending you, under separate cover, a copy of Water Supply Paper 234, containing papers on the conservation of water resources, and 400-A, 'The people's interest in water-power resources.' There is also sent you Bulletin 599, 'Our mineral reserve—how to make America industrially independent,' and a chapter from Mineral Resources of the United States for 1912, which contains an article on radium."

Mining men generally have little conception of the amount of aid which the Government can extend to them in their individual work. That the MINING CONGRESS JOURNAL has been very influential in calling attention to this very fact is indicated by the correspondence mentioning the JOURNAL being received by the Bureau of Mines and Geological Survey—the two bureaus whose 1,500 employees are engaged for the most part in work looking to the advancement of the mining industry.

Those who take advantage of the aids offered by the Government often enjoy considerable advantages over mining men who have not come to use this facility. Hundreds of letters are written by the Survey every month acquainting inquirers as to who buy and who sell certain mineral products. A long list of producers, as well as the buyers, are kept on file at the Survey and are furnished on application.

Every effort is made to reach inquirers, even if they are careless and forget to sign their names to the inquiry, or send samples for examination improperly packed. For instance an unsigned letter was received last month written on the stationery of a New Orleans

hotel. All information was furnished and forwarded to the proprietor of the hotel along with the original letter in the hope that he would be able to locate the writer. It is rather a common occurrence for tags to reach the Survey without the package of ore samples which undoubtedly accompanied them originally. This usually is due to carelessness in wrapping or attaching the tags or in using tags of flimsy paper.

That some persons have no hesitancy about using the Geological Survey is shown by a recent consignment of twenty-one samples from a Nevada mining man, who asks for the identification of the various samples he sent. The result of this particular examination is as follows:

1. Calcite-lime carbonate. 2. Limonite and calcite. 3. Galena in quartz. 4. Barite-barium sulphate. 5. Iron oxides with some MnO_2 . 6. Malachite, iron oxides, quartz. 7. Barite. 8. Iron oxides. 9. Altered igneous rock, possibly diabase or diorite. 10. Calcite and limestone, stained with MnO_2 . 11. Quartz with iron oxide and MnO_2 . 12. Calcite (aragonite?). 13. None so numbered. 14. Quartz with copper stains. 15. Vein material and altered rock with very little galena. 16. Two specimens. Calcite veinlets in an iron-stained altered rock. 17. Quartz with a little galena. 18. Apparently a quartzite. 19. Jarosite-hydrous potassium iron sulphate. 20. Rock-stained with copper and iron. 21. Highly silicified rock stained with iron and a very little copper.

LEAD ORE OF VERY LOW GRADE IS BEING HANDLED AT A PROFIT

The percentage of lead required to make lead ore have a commercial value varies with several conditions, as for instance, the character of ores occurring in the general district, and the distance from transportation and markets, the U. S. Geological Survey points out. In the western States, where silverlead ore is smelted, lead is desired as a "carrier" for the silver, and ore containing 10 per cent of lead, or occasionally less, is salable.

With a small smelter, distant from a market, lead ore carrying no other valuable metals probably would be required to contain 20 per cent or so of lead to be salable. However, crude lead ores containing as low as 2 or 3 per cent of lead are concentrated or cleaned by milling or hand-picking until by elimination of dirt and gangue the concentrates may contain as high as 80 per cent of lead. Such concentrates would at present have a value in the Joplin district of about \$100 per ton, according to C. E. Seibenthal, the Geological Survey's specialist in lead.

INSIDIOUS UNSEEN WASTES OF PETROLEUM MUST BE STOPPED, SAYS MANNING

Resources of the United States Will Be Depleted Prematurely Unless Determined Steps Are Taken Quickly, Contends Director of Bureau of Mines in Written Statement—Only Fifty Per Cent of Oil Recovered

In the course of its investigations conducted for the increase of efficiency in the mineral industries, the Bureau of Mines has given especial attention to the prevention of wastes in the production and utilization of petroleum, writes Van H. Manning, Director of the Bureau of Mines, in explaining the scope of the bureau's petroleum work. It has long been realized by the most intelligent and far-sighted producers that the insidious unseen wastes are far more serious than the visible wastes and that preventive measures must be taken if our petroleum resources are not to be depleted prematurely.

The losses or wastes, incident to the petroleum industry may be broadly divided into two classes, as follows: (1) Losses incident to production, and (2) losses through inefficient utilization.

Among the noteworthy wastes falling within the first class may be mentioned the unrecoverable oil, estimated to be more than 50 per cent of the oil in the land. In addition, there are the invisible wastes due to inefficient protection of oil and gas bearing strata against infiltrating waters.

LOSS IN UTILIZATION

Losses in utilization include not only the actual waste in the use of petroleum and its products, but the making of excessive amounts of less desirable products in manufacturing the products that are in most demand. For instance, gasoline is obtained chiefly from petroleum containing a large proportion of paraffin hydrocarbons, but many of these petroleum yield only small percentages of gasoline under the old distillation methods, so that their utilization in this way has been uneconomical and wasteful. By "cracking" processes the yield of gasoline has been largely increased, but the yield should be still larger. It is estimated that the output of gasoline by the Burton process, the cracking process used by Standard Oil companies, amounted in 1915 to 3,000,000 barrels, but this was equivalent to 18,000,000 barrels of Mid-Continent crude oil; in other words, only about one-sixth of the bulk of an average paraffin-base petroleum from the Mid-Continent field was converted into

gasoline by the cracking process most in commercial use in 1915.

Some striking facts regarding present conditions in the petroleum industry, with especial reference to the increased consumption and existing high price of gasoline, are given in a report made by the Secretary of the Interior to the United States Senate under date of February 2, 1916, and published as Senate Document 310.

GASOLINE PRODUCTION

The estimated production of gasoline in the United States in 1915 was 41,600,000 barrels and the amount exported in that year was 6,500,000 barrels, leaving a difference of 35,100,000 barrels for consumption in this country. These figures compare with a production of 12,900,000 barrels, exports of 1,640,000 barrels and an available difference of 11,260,000 barrels in 1909; and a production of 6,920,000 barrels, exports of 594,000 barrels and an available difference of 6,326,000 barrels in 1904.

In regard to the consumption of gasoline, the Secretary of the Interior says:

"The new uses of gasoline and kerosene (coal oil) are of comparative minor importance. The consumption of gasoline has been due to the tremendous growth of old uses.

"The principal uses of gasoline today are as follows:

"(a) Automobiles, motorboats, motorcycles, and aircraft.

"(b) Stationary internal-combustion engines.

"(c) Traction and other portable units.

"(d) General industrial and household uses.

"None of these has yet reached a stage where the future can be accurately forecasted."

The Secretary states that the recent extraordinary rise in the price of gasoline is due to the following causes: The increased consumption of gasoline within the United States, which is estimated to have been 25 per cent greater in 1915 than in 1914; the increase in exports; the depletion of gasoline stocks due to increased domestic and exports demands; the decreased production of crude oil containing a large percentage of gasoline; the increase in the price of crude oil; and financial influences.

DEPOSITS LIMITED

A fact, frequently forgotten, is that, in spite of the enormous production of petroleum in this country, approximately 65 per cent of the world's output, our petroleum deposits are of limited extent as compared with our deposits of coal. The restricted area of prospective oil lands limits the possible number of new fields, and makes imperative both the best use of our present known supply and the curtailing of unnecessary extravagance and of waste in the use of petroleum products. The use of oil as a fuel, when less economically valuable but equally available fuels, such as coal, are at hand, can not be too strongly condemned. We are constantly acquiring knowledge of the nature of the constituents of petroleum and of the possibility of converting these constituents into much wanted and valuable products adapted to higher forms of industrial use.

In conjunction with its efforts toward minimizing of wastes such as are described above, the Bureau of Mines has established at Pittsburgh, Pa., a laboratory that is investigating problems relating to the economical and efficient utilization of petroleum and the conversion of heavier and less desirable oils into lighter and more valuable products. This is the highest type of conservation, and conspicuous success has already been attained in the early investigations, the results of which are being given to the public in a Bureau of Mines bulletin. For the future, there is even greater promise of valuable additions to our knowledge in this field, to be obtained through work in the laboratory and, on a larger scale, through the cooperation and support of the producers and consumers of petroleum products.

This forthcoming bulletin deals with the cracking of petroleum and other hydrocarbons and the production thereby of gasoline, benzene, and toluene. The authors give a comprehensive review of the literature and present in much detail the results of the experiments made by Dr. W. F. Rittman, now chemical engineer of the Bureau of Mines, in the development of improved processes for manufacturing gasoline and benzene-toluene, and present some of the results achieved in working out the benzene-toluene process on a commercial scale.

Applications for patents on both processes have been filed with the intent of having the processes dedicated to the public and the patents assigned to the Secretary of the Interior as trustee for the people of the United States. On February 1, 1916, seven refineries, in six States, were installing plants for the gasoline process. Benzene and toluene were being produced in large quantities by the other process.

OKLAHOMA COAL OPERATORS RELEASED FROM PERMISSIBLE EXPLOSIVES REGULATION

Representatives of the Oklahoma Coal Operators have pledged themselves to make every effort looking to the early adoption of the use of permissible explosives in Oklahoma coal mines.

The matter was discussed very fully at a conference April 13, between the Secretary of the Interior, representatives of the Bureau of Mines, the Bureau of Indian Affairs and the Oklahoma Coal Operators.

As a result of this conference a complete understanding was reached between the operators and the department.

The committee representing the Oklahoma operators consisted of Messrs. P. R. Allen, vice-president, District 21, Southwestern Coal Operators Association; Frank Drew, secretary; James McConnell, James H. Hibben, Dorset Carter, and Carl Scholz, president of the American Mining Congress.

Many Freak Letters Received

Here are some samples of amusing letters which reach the Bureau of Mines:

"Will you be kind enough to send to my good friend —, a bulletin on how to get from a nickle's worth of gas as much as you pay for a quarter? I presume you have a bulletin of this character."

"In reply to your letter I wish to ask you to send me on one of your papers called No. 99 of the war in Europe on the ceramic industries of the United States in which I am sending you the 5 cents for it."

"If you have a sufficient supply of your recent pamphlet, entitled 'Hazards in Handling Gasoline,' I would be pleased to have half a dozen copies which I could keep for occasional distribution to parties whom I know are using that fluid in a dangerous way. I desire one just at the present time for a doctor's family, who by all the laws of physics and chemistry should have been blown up or burned up some time ago. I think the pamphlet is a very excellent one and it should be useful, for apparently Divine Providence hasn't sufficient time to look after all the fools in the world."—From a consulting engineer.

Florida Has Big Springs

No State in the Union has larger or more numerous springs than Florida. Many of them form good-sized streams from the start and some of them are navigable. The largest spring in the State, and one of the largest and probably the best-known in the United States, is Silver Spring, which is located six miles east of Ocala. This spring forms the source of the Oklawaha River, a tributary of the St. Johns, and steamboats traversing the river enter the spring basin, which has an area of several acres. The water is from 25 to 30 feet deep and is wonderfully clear, appearing absolutely colorless.

COAL MINING WILL CONTINUE TO BE ACTIVE INDUSTRY IN HOUTZDALE AREA

Widely Held Idea that Famous Clearfield District of Pennsylvania Has Been Worked Out is Erroneous—Little Left in Old Moshannon Bed, But Lower Deposits as Well as the Capseam Are Being Worked

A general impression has been created that coal mining in the Houtzdale area of Pennsylvania has dwindled to an insignificant industry. Recent observations on the part of George H. Ashley, of the United States Geological Survey, prove that such a conclusion is erroneous.

The Houtzdale area contains more faults than any other of the eastern coal fields north of Birmingham, Alabama. While faulting is a very common occurrence in the western fields of the United States, it is not the rule in Pennsylvania. The geology of the Houtzdale area is difficult to work out, owing to the fact that the rocks are not well exposed. A large amount of work along this line has been done by the Geological Survey and the geological formation of the region is now almost entirely mapped. It will be necessary, however, for some additional field work to be done in this region in order that fossils may be found to check horizons.

The Houtzdale area contains the center of the great Clearfield coal district, and is, as well, the center of the greatest flint-clay district in the United States. While it is true that coal mining has seen its best days in this district, yet there is certain to be considerable mining done for an indefinite period. The Moshannon coal bed, which varied from four and one-half to nine feet in width, yielded a great tonnage of coal in the 70's. The original bed has been almost worked out. At a depth of 150 feet lower than this bed another deposit of coal exists, which is being worked actively. Another bed exists 90 feet lower. Mining conditions, of course, in these lower beds are not so good, and in addition they are split up more than was the coal in the Moshannon bed.

Work is being done on the Capseam bed as well and it is the opinion of Mr. Ashley that it will be possible to take out all this coal.

During past years there have been a large number of small coal operations in this area, but changing conditions and the increasing scarcity of easily-mined supplies is rapidly ending this sort of work.

The clay from this district is of as high grade as any flint clay in the world. Fire bricks made from this clay are not only shipped to all parts of the United States, but a considerable quantity is exported. The soft clay of the region is also valuable; in fact, it is worth almost as much as coal.

Flint clay is worth, on the average, four times the price of coal at the mouth of the mines.

OCEAN FREIGHT RATES ON GRAPHITE INCREASE MANY TIMES

Only small amounts of the poorer grades of Ceylon graphite were imported during 1915, the extraordinary demand for the higher grades and the shortage of bottoms crowding out the cheaper grades, an investigation by Edson C. Bastin, of the Geological Survey discloses. The present high prices are a result of the increased demands, the increased freight rates, war surcharges and higher rates of insurance. At the close of 1915 the freight rates from Ceylon were approximately three times what they were before the outbreak of the war and early in March 1916 they had increased about five and one-half times the antebellum rate. A part of the increase in 1916 is due to the fact that all Ceylon graphite now comes around the Cape of Good Hope instead of via Suez Canal to avoid danger of capture in the Mediterranean.

"The graphite mining industry in Ceylon was in a very depressed condition during 1914 due to labor shortage and the unusually heavy rains that interfered with mining operations," Dr. Bastin has learned. This depression was aggravated by the embargo imposed in October, 1914, on the exportation of graphite to countries other than the Allies. With the modification of the restrictions on exports to the United States early in 1915 and the greatly increased demands for graphite for crucibles to be used in the manufacture of munitions of war, most of the mines resumed operation.

"The exports of graphite from Ceylon to the United States in 1915 considerably exceeded those in 1914 and the loss of the German and Belgian trade was partially compensated by increased exports to the United Kingdom and by large exports to Russia which hitherto had consumed very little Ceylon graphite," Dr. Bastin points out.

Geologists Working in Oklahoma

A party of the Associated Geological Engineers from New York, consisting of Messrs. Myron L. Fuller, Frank A. Herald, and Ralph W. Richards, is conducting geological investigations in northern Oklahoma and southern Kansas.

MANY NOTED MEN HELPED RITTMAN IN HIS WORK

Many minds contributed to the success of the Rittman experiments in developing new oil-refining processes, as is indicated by the following acknowledgments:

Particular thanks are due to Hon. Franklin K. Lane, Secretary of the Interior, for the great interest that he has at all times manifested in the development of the gasoline and benzene-toluene processes and for the hearty support that he has accorded the department employees who have been connected with the work.

Like measure of thanks is due to Mr. Van H. Manning, Director of the Bureau of Mines, for his sympathetic support and hearty cooperation. Without his confidence in the future of the processes they would still be in the laboratory stage of development and their possibilities in large-scale operations would still remain a matter of conjecture and theory.

President Nicholas Murray Butler, of Columbia University, by his kindness in extending the full use of the facilities of the university for the experiments, and by extending all possible privileges and courtesies, greatly facilitated the work.

Credit is also due in a large measure to Mr. W. A. Williams, chief of the petroleum division of the Bureau of Mines, for advice and assistance extended. He has kept in personal touch with the development work and has given freely of his time and knowledge in order to make it a success.

Acknowledgments are due to Prof. Milton C. Whitaker, of Columbia University, for practical advice and personal cooperation in the progress and development of the experimental work leading to the discovery of the processes; to Dr. George A. Hulett, of Princeton University, consulting chemist of the Bureau of Mines, for hearty cooperation and support throughout the long course of experimentation; and to Profs. J. R. L. Morgan, F. J. Metzgar, M. T. Bogart, and Hal T. Beans, of Columbia University, for practical suggestions and advice, and valuable time given to informal discussions of the principles involved in the problem. Thanks are also due to Prof. Gellert Alleman, of Swarthmore College, for constructive advice and assistance and material aid in the successful working out of the problem.

The authors desire to make particular acknowledgment of their indebtedness to Mr. A. J. Moxham, president of the Aetna Explosives Co., for his great interest in the development of the benzene-toluene process and for the time and personal attention that he has given to the related problems. The unflinching courtesy and great consideration that he has uniformly extended, in spite of the numerous discouragements and serious difficulties incident to the early stages of the development operations, have made the cooperative work a genuine pleasure. Acknowledgments are also due to Mr. Egbert Moxham,

general manager, and to Maj. J. T. Crabbs, division manager of the Aetna Company, for valuable assistance extended in the analysis and solution of operating difficulties and for facilities given in the accumulation of data concerning plant operations.

Especial acknowledgment is also tendered to Mr. Pennock Hart, president, and Mr. E. H. Haslem, general manager, of Mackintosh, Hemphill & Co., of Pittsburgh, Pa., for the aggressive manner in which the perplexing problems incident to the development of an industrial process from the laboratory to a commercially operative scale have been taken up and successfully solved. Too much credit can not be given to them and to Messrs. C. C. Stutz and S. McMillan and other members of their organization for the great personal interest taken and earnest efforts expended.

The authors are peculiarly indebted to Dr. F. L. Slocum for his valuable assistance and advice during the early stages of development work; also to Mr. Darwin S. Wolcott, for aid and advice and for the faith that he has at all times manifested in the success of the processes. The earnest personal efforts of Dr. David T. Day, consulting chemist of the Bureau of Mines, in the difficult initial work at the outset of the factory development are appreciatively acknowledged.

Thanks are also due to members of the working force of the Aetna Chemical Co. plant, both those connected with the mechanical operation of the process and those connected with the laboratory, for the whole-souled enthusiasm with which they have thrown themselves into the work and contributed unsparingly of time and energy for the successful development of the process.

Particular thanks are due to Dr. Gustav Egloff, who is in charge of the Aetna Company's laboratory at the development plant, for valuable services in connection with the industrial development of the benzene-toluene process and for aid in the preparation of this paper.

JOEL F. VAILE, OF DENVER, VICTIM OF HEART DISEASE

Joel F. Vaile, of Denver, Colorado, died of heart trouble at Pasadena, California, April 3, 1916, at the age of 68 years. Mr. Vaile for thirty years had been connected with the legal department of the Denver and Rio Grande Railway and was its general counsel at the time of his death. As a mining lawyer Mr. Vaile came into prominence because of his connection with the "Last Chance" litigation. Mr. Vaile, by his great learning, his affability, his toleration and his uniform courtesy, endeared himself to all who came in close contact with him.

The American Mining Congress will miss him from its membership and its secretary will miss the kindly advice and cooperation always so freely given.

**GOVERNMENT EXPERTS WELL
KNOWN TO MINING MEN**



B. S. BUTLER
Geologist

B. S. Butler, who is in charge of the copper work being done by the Geological Survey, was born in Gainesville, N. Y. He attended the common schools at that place and was graduated from the high school at Nunda, N. Y. He attended normal school at Geneseo. Following his normal school course for two years he was principal of the schools at Portageville, N. Y. His university education was obtained at Cornell, where he also served for two years as instructor in geology and physical geography.

Mr. Butler began work in the Geological Survey in 1907, during which time his principal work has been confined to California, Utah and Alaska. He made a detailed investigation of the copper resources of Shasta County, Cal., and studied and wrote a report on the San Francisco and adjoining districts of Utah. He also made an investigation of potash deposits at Marysvale, Utah, and more recently has made a general study of the mining camps of Utah.

**SMOKELESS COMBUSTION OF COAL
BULLETIN IS MOST POPULAR**

The Bureau of Mines "best seller" is Bulletin 40, dealing with the smokeless combustion of coal. More copies of this publication have been sold than any other which has been issued by the Bureau of Mines.

In a way, the Bureau officials consider that the number of documents sold for cash is an acid test which indicates the real interest of the country in the publication.

When a bulletin is ready for distribution the Bureau advertises the fact as widely as possible by means of notices in the press and by sending out postcards to selected lists of names. In addition copies of bulletins are mailed without request to those most certain to be interested.

The demand for a bulletin is carefully estimated, and a large number of copies are set aside for free distribution. When this supply becomes exhausted, it is necessary for those desiring copies of the bulletin to secure them from the Superintendent of Documents, when a charge, covering the actual cost of publication, is made.

Next to Bulletin 40 in popularity, as indicated by the number sold, is Bulletin 22. This bulletin treats of analysis of coal throughout the United States. Other bulletins which are particularly popular are mentioned as follows, in the order of their popularity:

Bulletin 8, dealing with the flow of heat through furnace walls.

Bulletin 21, dealing with the significance of drafts in steam boiler plants.

Bulletin 39, dealing with the smoke problem at boiler plants.

Bulletin 41, dealing with the Government coal purchases under specifications. This bulletin urges that coal purchases be made with regard to the heating value of the coal as expressed in thermal units.

Bulletin 63, dealing with sampling coal deliveries.

Bulletin 67, dealing with the use of the electric furnace in iron and steel making. This bulletin has been particularly popular and ranks thus low on the list due to the fact that it has not been available for distribution as long as have those mentioned above.

Bulletin 57, dealing with safety and efficiency in mine tunnelling.

Bulletin 70, dealing with the Bureau's investigations of radium.

Bulletin 77, dealing with the use of the electric furnace in metallurgical plants.

The most popular technical paper, perhaps, which has been issued by the Bureau of Mines is number 80, which deals with the hand firing of soft coal under power plant boilers.

WESTERN LIGNITES OFFER PROMISING FUEL SUPPLY

To one thoroughly familiar with the great extent of the Western lignite deposits, their limited development, and the comparatively simple methods that have thus far been adopted in their utilization as fuel, any investigations looking to a possible and increased utilization of these vast deposits must at once be considered of great economic importance. There is no doubt that much can be done toward improving the methods of burning now in use, and in providing means for using the coal in other forms, such as in a pulverized state, or in the manufacture of producer gas, or of by-product gas, or as residue briquets, according to E. J. Babcock of the Bureau's staff. Especial attention has been given by Mr. Babcock to the study of utilizing the lignite in the form of residue briquets and in the manufacture of by-product gas, because in this method there appear excellent possibilities of providing a satisfactory and efficient fuel and of recovering numerous by-products.

From the results obtained by the methods being developed at the school of mines and the substation of the University of North Dakota there seems little doubt that the briquetting and the production of gas from lignite can in the near future be put on a commercially satisfactory basis.

Because of the ease with which the gas is produced, the low price of the original lignite, the value of the residue, and the low price for which it could be sold if manufactured in a plant used to produce briquets from the residue, the lignite gas should have a large commercial utilization for heating, lighting, and power purposes. It has been found that briquets made from this concentrated residue produce a most excellent fuel, for all practical purposes approaching the efficiency of anthracite. One ton of the air-dried lignite will produce from a half to two-thirds of a ton of briquets in addition to 8,000 or 10,000 cubic feet of gas. The briquets have about twelve-thirteenth the actual heating value of hard coal, and they can be shipped for considerable distances and still prove profitable. The briquets present many advantages, especially over the original lignite as usually placed on the market. The heating value is nearly doubled, the briquets do not disintegrate on standing or burning, they can be stored without being affected by atmospheric conditions, they are uniform in size and are convenient to handle.

COST CALCULATIONS

No detailed statements of the cost of operating a large commercial plant are given in this report for the reason that the cost per ton of briquets and per 1,000 feet of gas and other by-products will depend upon a large number of factors, any one of which may materially affect the cost. For example,

the cost of production is much less in a large plant than in a small one, and also less in a plant favorably situated—that is, near a mine, a city, and railway facilities. The use of mine slack, the percentage of moisture in a given lignite deposit, and the relative cheapness of mining and ease of delivery to the plant are all variable conditions and would have to be determined for each individual plant.

In addition the plant could be operated under many modifications of the general process that has been explained; for example, all or a part of the gas might be sold for heating or lighting purposes or converted into electricity. The extraction and production of gas might be carried further in one plant than in another, or the by-products, such as tar and ammonia, could be recovered and marketed, used in part, or entirely neglected. Differences in any of these conditions would materially modify the cost of production.

In general the larger the plant and the more complete the saving of by-products the smaller will be the cost of production. It is believed that in a carefully constructed and operated plant the saving and utilization of the various by-products will so reduce the cost of operation as to make the industry commercially practical and profitable.

All of the data obtained from the investigations and the operation of the experimental plant indicate that a plant of fair capacity, if so constructed as to economize in the original cost, as well as in the cost of operation, and if operated efficiently and under careful management, should turn out excellent commercial products at a cost that would admit of a fair profit.

In order to establish the industry successfully great care should be taken in planning and operating the plant, and the methods employed should follow very closely those that have proved satisfactory in the experimental work, the principles of which are outlined in Mr. Babcock's report, which just has been published by the Bureau of Mines.

Although the general principles involved in the process explained in this report are not complicated, the proper observance of the many details of operation is essential to success, and those managing and operating the plant should have had technical training and experience.

The development of methods for the utilization of low-grade coal will prove of much value to those communities nearest the great lignite deposits in the West. In some of these the lignite could be converted into electricity, which in turn could be sent to surrounding towns and villages, thus distributing power and light from numerous central power plants. Such an arrangement would not only be a great saving of our fuel resources but would also result in the establishment of many industries that can be developed by abundant and cheap electric power.

EXTENT OF DEPOSITS

The existence of vast deposits of lignite in the West, Central and Western States is well known, although the extent and importance of the deposits have not been appreciated, nor has there been an adequate economic utilization of the deposits.

The work of the Bureau of Mines, the United States Geological Survey, and the State geological surveys is disclosing an increasingly large area, underlain with this kind of coal. Among the States having the largest workable deposits may be mentioned North Dakota, Montana, Wyoming, Colorado, and Texas, and in several other Western States lignite occurs in smaller areas. In North Dakota alone it is estimated that the deposits cover approximately 32,000 square miles, many of them being 10 to 15 feet thick and capable of producing in all several hundred billions of tons of lignite.

When one stops to consider what these figures mean as to the immensity of these deposits in the West, it is not strange that people are seeking to ascertain better means for deriving larger benefits from the proper utilization of those great deposits. Consequently, any proposed methods of utilization that are promising are well worthy of careful consideration.

SCOPE OF INVESTIGATIONS

The Bureau of Mines has been investigating more efficient methods of utilizing fuels. In the State of North Dakota there has been begun at the college of mining engineering of the University of North Dakota, at Grand Forks, and at the mining substation, at Hebron, extended work on a variety of new and practical methods of using lignite. In this work special attention has been paid to the production of gas and its utility and economy for heating, lighting, and power purposes and the manufacture of briquets. In addition, many other improvements in methods of burning and utilizing lignite have been attempted. As the Federal Government controls great tracts of land underlain with lignite, it has a direct interest in the utilization of this fuel, and the Bureau of Mines, in its investigations of fuels belonging to or for the use of the Government, has cooperated in the study of lignite.

What has been accomplished in this experimental work leads to the belief that great improvements can be made in the methods of utilizing lignite and in the manufacture of cheap gas for power and other purposes, and that the making of high-grade fuel briquets can be put on a commercially satisfactory basis. The result will be that not only will lignite be much more serviceable and much more generally used, but an immense quantity of slack and coal that would otherwise be wasted will be saved.

Furthermore, by the process described in this bulletin, large quantities of gas, especially valuable for power purposes, may be obtained at a low cost, as the work thus far carried on indicates that this gas can be used successfully with an internal-combustion engine for the production of electricity so as greatly to reduce the cost of power production and thus make possible a wide utilization of cheap electricity for industrial purposes.

WESTERN LIGNITES

In order better to understand why these lignite deposits have not been developed more rapidly and to see what changes are needed to increase their value and usefulness, it is necessary at the start to consider certain general characteristics of lignite.

Western lignites, from different localities, though in general similar, differ somewhat in both physical and chemical properties. Not only in different districts, but also in different mines, the composition varies considerably, especially in ash content, a matter of much importance in connection with the utilization of lignites. If the ash content of a lignite to be used in the production of gas is high, the ash content in the residue will be considerably increased through concentration in carbonization, and hence the residue will be less valuable for use in making briquets.

PROSPECTOR APPEALS TO

"HEAD U. S. CHEMIST"

The following letter, addressed to "Head U. S. Chemist, Washington, D. C." is reprinted without changes in spelling or punctuation. It indicates that it is not only the educated mining man who relies on the government for aid. The letter referred to is as follows:

"Inclosed find sample of moylidnim.

"With chemicals hand the assay to Hon. Secretary of War tell him to arraigne with the U. S. to buy it, then send your assay to some refinery. Have the superintendent of the refinery to inform Jessay McCoy what he will pay for it in base form. Landed at —, Mont., in carload quantities; when you find out about it address a letter to McCoy what action the U. S. take. I may be away when the letters arrive.

"P. S. You will find a small part of alluminum in it."

Director Smith, of the Survey, in reply said:

"Your letter of March 25, addressed to the 'Head U. S. Chemist, Washington, D. C.' has been referred to this Survey for reply.

"The material which you send is too impure to be of value for a molybdenum ore. It may be of interest to you also to know that the U. S. Government does not purchase molybdenum ores, and also that the Survey is prevented by law from making assays or analyses for private persons or corporations, as you will note from the inclosed slip."

MAGNESITE MINING BOOMS AS WAR SENDS PRICE HIGH

Prices for magnesium have reached the point where the manufacture of metallic magnesium has been undertaken recently by at least four concerns, which had not been manufacturing this metal previously. The companies referred to are: Aviation Material Corporation, 99 Cedar Street, New York; General Electric Co., Schenectady, N. Y.; Magnesium Manufacturing Co., Rumford Falls, Me., and the Norton Laboratories, Lockport, N. Y.

Before the war magnesium was worth \$1.60 per pound. Since then it has gone as high as \$10 per pound, although at the present it is being furnished at about \$7 per pound.

Magnesium, of which there are extensive deposits in the United States, is necessary to the manufacture of shrapnel and illuminating shells. In shrapnel a few ounces of magnesium are placed in order to make visible the point where the shell explodes. In the daytime the magnesium gives out a characteristic white cloud, while at night its blinding flame is visible at long distances.

There is an increasing demand for magnesium in other industries. It has been found that by alloying it with zinc, that a lighter and tougher material than aluminum can be obtained. Just at present there is a great demand for this material for constructing frames for aeroplane engines and for other constructional purposes where weight is a factor.

Queer enough metallic magnesium is not made from magnesite, the carbonate, but from magnesite chloride. Magnesite chloride before the war was obtained almost exclusively from Stassfurt, Germany, where it was obtained as a by-product from potash. The German product was sold here from \$6 to \$8 per ton. This was much lower than it could be produced in this country from bitterns or by treating magnesite silicate or some other form of magnesite-bearing rocks with hydrochloric acid.

Magnesite also has become very scarce. The brick and steel makers in the United States depended largely upon Austria for their supplies, although some was obtained in Greece before the war, and that country is still furnishing a certain limited supply.

The war, however, has resulted in the most exceptional mining activity in the deposits in California and Nevada. Previous to the war little of the California magnesite was used due to the fact that it did not contain iron oxide, which made it practicable for use. It remained for Frank L. Hess, a geologist in the Geological Survey, to point out that the same result could be obtained by mixing iron oxide with the California product.

Another factor which has made possible the use of California magnesite is the fact that there have been very decided reductions in railroad rates as a result of the opening of the Panama Canal. A considerable number of new calcining furnaces have been blown in in



OUTCROP OF MAGNESITE IN LOWER CALIFORNIA

California and an increased quantity of magnesite is reaching the eastern market.

One of the most remarkable magnesite deposits in this hemisphere exists on Santa Margarita Island off lower California. This deposit is described as being very extensive. It is being exploited by the International Magnesite Co., of which J. E. Blackman, 665 Wilshire Place, Los Angeles, Cal., is the president.

NEW MOVING PICTURE FILM SHOWS BUREAU'S WORK

At the request of Director Manning of the Bureau of Mines, a new two-reel film, "The Work of the U. S. Bureau of Mines," has been made and is now available for the use of the Bureau. The following subjects are illustrated: Mine rescue training; bureau rescue crew at mine explosion; first aid by bureau-trained miners; testing explosives; sand test to determine the strength of electric detonators; inflammability of coal dust; rock-dust barriers; sampling and analyzing mine air; methane indicator; using canary bird to detect nonrespirable air; testing oil safety lamps; testing electrical equipment; coal sampling; instrument making; determination of the clinkering quality of ash; glass-blower making intricate chemical apparatus; separation of gas mixtures by fractional distillation in a vacuum at low temperatures; radium.

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EDITORIALS

CHANGES IN MR. HAYDEN'S BILL ARE SUGGESTED

The American Mining Congress believes that the enactment of House bill No. 12426 to authorize mining for metalliferous minerals on the Indian reservations in the State of Arizona will be of great benefit in that it will make possible the development of metalliferous mines within the Indian reservations, and thus make valuable this now unknown resource.

Section 8 of the bill provides a royalty of 5 per cent on the gross value of the output of minerals at the mine. We believe this section should be changed as many complex ores carry various metallic values which it is impossible to recover and in most instances there is a great loss in the reduction of metalliferous ores. For instance a complex ore carrying gold, silver, lead, zinc and antimony might easily be penalized upon the zinc and antimony contents to such an extent as to reduce by 50 per cent the actual value recovered from the ore.

The customary form of lease in use throughout the West provides for a graded royalty. The higher grade of ores call for a higher royalty charge.

Upon the operation of mines more or less developed the customary charge is 10 per cent of the net returns upon milling ores call for a higher royalty charge. that concentration is required to produce a product sufficiently valuable to justify freight and smelter charges) and 15 per cent upon ores of a character to justify direct shipment to the smelter.

To meet this theory the following form is frequently used:

To pay said lessor as royalty 10 per cent of the net mill or smelter returns upon all milling ores and 15 per cent upon all net mill or smelter returns of all smelting ores.

This form might lead to misunderstanding by those who do not understand that low grade ores are required to go through two manufacturing processes before the mineral is ready for the market. Another form which may be better understood is as follows:

To pay to said lessor as royalty 10 per cent of mill or smelter returns on all ores sold for \$10.00 per ton or less net price after deducting freight and milling charges, and 15 per cent of the like net mill or smelter returns on all ores sold for more than \$10.00 per ton net price as aforesaid.

There would seem to be no reason for the requirement in Section 10 that the operator should furnish information concerning the cost of mining, in that it does not matter to the Government how much money is spent in operations so long as the royalties are paid upon the returns of the ore produced.

COOPERATION NEEDED TO STOP CAR SHORTAGE

The recent congestion of freight and the inability of shippers to get their goods to market has called special attention to the need of greater efficiency in the handling of freight by the railroads of the country.

The number of freight cars required to handle the traffic can be greatly diminished. While the rapidity with which cars are handled from one point to another and the time required in loading and unloading has much to do with

the efficiency of car service, another element, which is usually lost sight of, will be of marked benefit in reaching a solution of this problem.

Mining products can easily be loaded to the full limit of the cars, which is 10 per cent beyond their rated capacity. An 80,000 capacity car weighs approximately 42,000 pounds, and in most cases where mine equipment is involved the empty car is returned without loading, in which case the tare weight must be considered twice, hence the net compared with the gross is 48.8 per cent. If these cars are loaded 10 per cent beyond the stencilled capacity, which is the permissible limit, the net of the car is at once increased to 51.1 per cent, showing a saving of $2\frac{1}{2}$ per cent without any cost to the shippers. In fact there is a gain because of the reduced number of times in which the cars are shifted under the tippie, which involves a loss of time as well as in the fact that every time the car carries 10 per cent more than it usually holds the selling expense is reduced correspondingly.

Coal operators have frequently suffered much hardship because of their inability to get sufficient cars to handle the traffic. Better service which would result from full loaded cars not only for full shipment but upon return shipment of supplies would enable the railroads to render better service and is a decided step toward efficiency.

HEAVY LOSSES IN MEXICO A WARNING TO CAPITAL

Matters in Mexico, so far as the mining man is concerned, have improved very little despite the fact that a large area of the republic has enjoyed a sort of peace for a number of months. Of course with the existing conditions in Chihuahua, Sonora, Durango, Coahuila and other northern states no mining operations are being carried on. In the central and southern states, however, some companies are operating despite the irregularity of transportation and the instability which characterizes the whole political structure. Great difficulty is being experienced, according to ad-

vices reaching Washington, in obtaining explosives. If explosives pass the Federal authorities at the Custom Houses they have to run the gauntlet of the state and municipal officials. Each little chief seems particularly desirous of accumulating whatever explosives may come within his graps. As so much of the mining in Mexico is done in the hardest sort of rock very little progress can be made without dynamite.

Now that Carranza proposes to make drastic changes in the mining laws, a fresh bunch of troubles doubtless is in the offing.

While it always has been the attitude of the American Mining Congress that so long as opportunities for investment in promising properties in the United States are offered, American capital should not be so ready to reach into foreign countries. The tremendous losses that have been visited upon Americans who have invested in Mexican mining properties, doubtless will do much to discourage such investments for many years to come.

The blame, however, is not to be placed upon the American investor. The mining laws of the United States are so archaic that they have forced millions of dollars of American capital into other countries where the mining laws are better suited to the development of the industry. It is the very generally accepted belief that a large percentage of the capital that is now going into foreign countries for investment in mining properties will stay in the United States as soon as the laws have been revised intelligently.

The trouble in Mexico is not with the mining law. The law in that country during the administration of Porfirio Diaz was intelligently interpreted and was very generally satisfactory to the mining industry. Regardless of the widely accepted opinion that the courts were not the most honorable in the world, there was a minimum amount of litigation. It is true that there were several spectacular cases which involved foreign interests before the Mexican courts, to which much publicity was given and in some quarters created a rather erroneous

idea as to the amount of litigation in that republic.

While the American Mining Congress is in no way in sympathy with the lax manner in which the State Department is insisting on the rights of the American mining man in Mexico, it is of the opinion that a great deal of the capital that has gone into Mexico would have been invested to a greater advantage in the United States. There are such vast undeveloped mineral resources in this country that are crying out for capital, and which offer such splendid opportunities, that we can but regret seeing such great quantities of money going to the developing of mineral resources in other countries.

PERMANENT GOOD RESULTS ARE FOLLOWING RESEARCH

Conduction of extensive researches into mining and metallurgical problems under present conditions is regarded by scientists in Washington as likely to be one of the most far-reaching benefits of the present war. Under normal conditions profits are not such as to justify anything like the amount of experimentation that is now in progress. Out of all these experiments great permanent good has come and the promise is that much greater benefits will result. Not all of the achievements are positive. There is a great deal of negative information being obtained in the laboratories and by engineers, the importance of which often times is overlooked, but which is of the greatest value to the industry.

There is a great difference of opinion as to the future of the metal market following the declaration of peace. All of the prominent specialists who have any ideas on this subject, however, agree that it is best to subordinate everything else to the idea of getting the hay into the barn while the sun shines. The price of many metals may be sustained after the war, but the chances of a different result are sufficient to cause all to advise the quick marketing of all metals at present prices.

STATISTICAL INQUIRIES SHOULD GET QUICK REPLY

Mineral producers throughout the country are urged to be as prompt as possible in making statistical returns requested by the Geological Survey and the Bureau of Mines. This cooperation on the part of mine operators greatly facilitates the compiling of very valuable information to the industry.

Director Smith of the Geological Survey advises us that the delay in getting these replies is greater this year. As we are on the ground and in daily touch with the work being done by the Geological Survey and the Bureau of Mines in the interest of the mining industry we can see the need for the prompt compliance with this request more clearly perhaps than the busy mine operator in some other part of the country.

The Government is doing very remarkable service in the interest of the mining industry. This is especially true when it is considered that Congress supplies it with inadequate funds to undertake work on the scale that really is necessary. Considering the money at their disposal the directors of the Geological Survey and the Bureau of Mines are accomplishing notable results.

LEASING SYSTEM WILL PERPETUATE MONOPOLY

The application of the leasing system will throttle development. It will perpetuate a monopoly in those who have already acquired ownership in mineral resources. It will create a system of landlord and tenant between the Government and its citizens, entirely subversive of the best interests of the nation. The States will be unable to maintain law and order over the whole of a territory more than one-half of which is exempt from the state taxing power, without unjust burdens upon its taxpayers. In order to maintain properly its hospitals and asylums, its courts, its schools and public roads, the State must have the right to tax all the property benefited by these public agencies.

AT PRESENT RATE OF PRODUCTION PETROLEUM WILL LAST 27 YEARS, SAYS RANDALL

Oklahoma Representative Calls on Secretary of Interior for Extensive Information
With Regard to Oil Industry and Asks Him if It is Advisable
for the Government to Go into the Oil Business

Hearings are in progress before a subcommittee of the House Committee on Mines and Mining, on House Resolution 175, by Mr. Randall, of Oklahoma. Mr. Randall, in explaining his resolution, makes the following statement:

"This resolution is divided into practically two resolutions. One is rather a sequel of what may be developed under the first section. For instance, the resolution first asks the secretary to supply information as to the area and estimated supply of oil-bearing lands now owned by the United States with a discussion of the various grades of oil that can be produced. The further estimated fuel needs of the navy for a term of ten years are asked and the effect upon the navy if such oil lands are permitted to remain in private ownership and in the hands of speculators. Thirdly, the resolution asks the secretary's opinion of the advisability of the establishment by the government, through the Bureau of Mines, of oil pumping plants. It also asks for the secretary's opinion of the production of gasoline by the Rittman process and such other agencies as may be required to utilize the oil reserves in the United States.

"As a sequel to the foregoing portion of the resolution it is provided if the secretary finds, from the situation as to the government's interests, that it would be necessary to go further and acquire the remaining oil lands of the country, then we ask for his recommendation as to that.

INCREASED USE

"I have called attention in the preamble to the great increase in the production of gasoline, which, I believe, is estimated as having risen from 6,680,000 barrels in 1899 to 41,600,000 barrels in 1915."

In the preamble of his resolution Mr. Randall declares that the products of petroleum have become absolute and daily necessities in almost every avenue of industrial enterprise as well as in the social and domestic life of the people. He states that the power generated today by gasoline and other products of petroleum is more than double that produced by all other agencies combined. He estimates the total visible supply of petroleum in the United States today at 7,600,000,000 barrels, and that at the present rate of production, 280,000,000 barrels per year, the supply would be exhausted in twenty-seven years. He also contends that exploitation

of rich petroleum deposits is being carried on by monopolistic corporations to secure quick and unearned profits, without regard for the conservation of this natural resource.

In this connection, Mr. Randall makes the following statement with regard to the Standard Oil Company:

"The Standard Oil group has distributed since December, 1911, in regular and extra cash dividends a total of \$290,666,083, to which must be added stock dividends at par totaling \$169,100,000, and taking into account the present market price of distributed stock, the profits of this corporation, reaped from a natural resource placed in the earth for all the people, is in excess of \$500,000,000 in the last four years."

CONCLUSION

He draws this conclusion:

"Nearly all waste of petroleum and crude oil can be saved by producing gasoline through the Rittman process, discovered in the Bureau of Mines, and now the property of the United States, which not only increases the yield of gasoline, but utilizes for this purpose crude oil, kerosene or any other low-grade distillates, none of which are now used.

"This process has been placed freely at the disposal and use of private refining companies, including the Standard Oil Company, but was declined because the government insisted on a clause in the contract prohibiting its monopolistic use."

The provisions of the bill are: That the Secretary of the Interior be directed to furnish the House of Representatives information in this department as follows:

First. The area and estimated supply of oil-bearing land owned by the United States, with description of the various grades of oil which can be produced.

Second. An estimate of the fuel needs of the navy for a term of ten years and the effect upon the navy if such oil lands are permitted to remain in private ownership and in the hands of speculators.

Third. The advisability of the establishment by the government, through the Bureau of Mines, of oil-pumping plants, gasoline production by the Rittman process, and such other agencies as may be required, utilizing the oil reserves of the United States.

It also is provided that the Secretary of the

Interior be directed to report to the House of Representatives his opinion as to the advisability of the purchase, by condemnation proceedings, or in any manner whatever, by the United States of the entire oil-producing area of this country, to the end that the United States may protect fuel supplies for its own use in the future and to conserve for all the people a natural resource which is so indispensable as petroleum.

B. F. GOODRICH COMPANY FINDS ADVERTISING BIG ASSET

The growth of the B. F. Goodrich Co., which is the largest rubber factory in the world and produces over 20,000 different articles of rubber, including auto, motorcycle, bicycle, truck and carriage tires, hose, belting, packing, molded goods, raincoats, boots and shoes, water-bottles, and in fact "everything in rubber," is largely attributed to its progressive advertising policies. In fair weather or foul, Goodrich advertising has stood forth as prominently and continuously as Gibraltar.

The Goodrich Company always has been a strong believer in advertising because it has seen its business multiply and prosper under the sun and rain of publicity. In no other way could it have told so many millions of people about the goodness of Goodrich goods, in so short a time, or so economically. The Goodrich factories are at work night and day. Each year the company invests more and more money in advertising and each year is forced to build and build to care for increasing business.

E. C. Tibbits, on April 7 concluded his nineteenth year as the advertising manager of the B. F. Goodrich Co.

USE OF DOUBLE CASING IN ARTESIAN WELLS

In their investigation of the wells and underground waters of Florida the geologists of the United States Geological Survey have noted many interesting things. Among these is a well at Welaka, on St. Johns River, from which two kinds of water are obtained.

This well is 309 feet deep. The length of the casing is 110 feet. The well was first drilled to 160 feet, and from this depth ordinary "sulphur" water was obtained. The drill was then carried to a depth of 309 feet, where it encountered a strong mineral water, having a disagreeable, salty taste. In order to use both kinds of water an inner tubing was run nearly to the bottom of the well. Both this and the outer casing were connected with pumps, so that ordinary water and mineral water can be pumped at the same time. A favorite joke played on visitors is to give them a drink of the weaker water in the first glass and to replace it with the brine in the second.

Not more than half a dozen wells of this kind are known in the country, but there is no reason why similar wells cannot be obtained in regions where the waters in the upper strata differ from those lying deeper.

CHICAGO PAPER IMPRESSED BY DR. HOLMES' WORK

Chicago Tribune.

It was about eight years ago that Congress authorized the creation of the Bureau of Mines. Dr. Joseph A. Holmes, who died recently, was the moving spirit in the work of securing the sanction of Congress for the plan to establish a bureau. The study of conditions in the mines of the country and of means to decrease the number of accidents incident to their operation was the life labor of Joseph A. Holmes. His death was due largely to the hard work that he did in order that the lives of others might be saved.

It is gratifying to learn from a report of the Secretary of the Interior, of whose department the Bureau of Mines is a part, that the death rate of each thousand men employed in the mining industry is lower than it has been in sixteen years, and it should be remembered that mining operations have increased largely in extent. Secretary Lane says that as a result of the general safety campaign that has been carried on for several years, accidents in the mines not only are decreasing, but that other mining conditions are improving and that there is possible today "the most gratifying report that the bureau of mines has been able to make since it was established."

The work of Dr. Joseph A. Holmes was not lost. He began a campaign which other men now are carrying on. The United States today mines 40 per cent of the entire coal of the world, as much as Great Britain and Germany combined. It employs an ever-increasing army of men, who need protection in their perilous occupation. It is grateful to be able to say that miners and operators generally give credit to Dr. Holmes for his high and successful endeavor.

Col. W. L. Stevenson, President of the Hargraves Engineering Co., of Skagway Alaska, has been in Washington, New York and other cities on business connected with the company. The company is operating an antimony mine on the Kantishna River, Alaska and has received favorable reports from its engineer in charge.

John A. Rice, a mining engineer of El Paso, who has been in charge of exploratory work in a mining property at Silver Center, near Cobalt, Ontario, was in Washington April 21 and 22. He is en route to take up work in southeastern Utah.

IMPORTANCE OF FLOTATION IN METALLURGY TOO VAST TO ESTIMATE

Development of Last Two Years a Remarkable Chapter in the Mining Industry of United States—Accumulation of Ores Which Could Not be Treated Profitably in Past Now Are Yielding up Precious Contents

The following general statements on flotation are authorized by the Bureau of Mines as a mode of answering a type of general questions the bureau is receiving in great numbers, and also in order to convey a general idea of what flotation is, how it may be of service, and where more detailed information may be obtained. Later, the bureau plans to issue a bulletin on flotation and to describe fully the application of the processes in use.

TYPES OF PROCESSES

Flotation is the process or processes by which the valuable minerals in a mass of finely ground ore can be caused to float on a liquid into which the finely ground ore is fed. The different flotation processes can be classified under two types, *film flotation* and *froth flotation*.

In film flotation the mineral particles that float are sustained on the surface film of the liquid. In froth flotation the minerals floated gather in and on the surfaces of bubbles of air or gas driven into or generated in the liquid in some convenient manner. As the surface of a mass of bubbles overlying a liquid is greater than that of the upper surface of the liquid, a froth will carry a greater burden per square foot of area of liquid than the film surface of the liquid.

Bubbles of gas or air in the pulp may be made in many ways: By beating in air with a device resembling a ship propeller or the impeller of a centrifugal pump (Minerals Separation and other machines); or by turning in compressed air in fine streams (Callow and similar pneumatic cells); or by generating a gas by chemical action of an acid on some constituent of the ore, like calcite or siderite (DeBavey and Delprat processes); or by applying reduced pressure to the surface of a pulp saturated with air and causing the dissolved air to be liberated in bubbles (Elmore process).

For all practical considerations, these processes of froth flotation obtain the same result in much the same manner. In each, bubbles attach themselves to particles of valuable minerals and carry these particles to the surface of the pulp where the resultant froth can be skimmed off or allowed to overflow.

Several specialized types of flotation have received names that are becoming standard. *Selective flotation* is fairly generally understood to refer to the surface or froth "select-

ing" the valuable minerals rather than the gangue of the ore. Sulphide minerals as well as a few native metals like gold, silver, and copper can thus be selectively floated from a gangue consisting largely of quartz, calcite, feldspar, or other "rocky" minerals. However, some metallurgists have recently adopted the term in another sense, using it instead of the term *differential flotation*. By *differential flotation* is meant the flotation of one floatative mineral in the presence of another ordinarily floatative. For example, the flotation of galena from a pulp containing sphalerite is a true differential flotation. Another type of flotation that has been much talked about is *preferential flotation*, which is a name applied to a special type of differential flotation by Horwood, an Australian metallurgist, who gives a mixture of two floatative sulphide minerals a light roast in order that one may be oxidized while the other remains unchanged. Only the surface film of one of the minerals is oxidized, but this suffices to keep it from floating. Thus, if an ore contains galena and sphalerite, the galena can be superficially oxidized so that it will not float, while the sphalerite, which is more resistant to roasting, can be floated *preferentially* from the mixed pulp.

Oils of various kinds are generally used now in flotation in order to give permanent froths and to make the air bubbles attach to certain minerals only. Animal, vegetable, and mineral oils, including acid sludge, have been used with more or less effect, but those oils that seem to be most widely favored at present are derived from the distillation of wood, or from the resinous products from certain woods. Particular ores or mixtures of minerals seem to require oils having certain properties, and at present it is necessary to find by tests the oil or mixture of oils that will give best results with the ore to be treated.

ORIGIN OF FLOTATION

Although flotation has only recently received the general attention of American metallurgists, it is not by any means a new method of ore concentration. As far back as 1860, it is reported that an Englishman named Haynes patented a process which depended on the fact that if a mixture of the minerals could be wet by certain oils, while the other minerals of the ore would not be

wetted by these oils. In 1886 Bradford and Everson both attempted to apply the affinity of oil for wetting various minerals, and since then the effort has been repeated frequently. It was not recognized at first that there is no need of using a large amount of oil to do the floating and that much more buoyancy can be obtained in the floating scum of oil and minerals by blowing in air bubbles to form a froth. "Bulk oil" flotation was thus the first logical development, and this gradually led to frothing flotation methods; then the amount of oil was cut down, and now there are mills that use as little as 0.2 pound of oil per ton of ore, and some that use no oil at all.

APPLICATIONS OF FLOTATION

The great field of flotation has been the prevention of slime losses in ordinary concentrating mills for ores containing valuable sulphides or native metals. In such mills copper, lead, and zinc sulphides, when finely divided as "slimes," have often been completely lost and only the coarser particles of ore recovered. There has been a considerable development of such concentrating devices as slime tables, vanners, bubbles, and other devices for the recovery of these valuable minerals from slimes, but the extractions obtained by these devices have never been wholly satisfactory. For minerals such as those mentioned flotation fills a long-felt want. In fact it is only the fines and slimes that are capable of treatment by this process, as the larger particles of mineral sink, being too heavy to be supported by bubbles or the film surface of a liquid.

Where the valuable minerals of an ore occur as very small grains, so that the ore must be crushed exceedingly fine in order to liberate them, flotation evidently is particularly suitable for removing the fine particles of valuable minerals. Further, when an ore contains a valuable mineral having the same specific gravity as the gangue (for instance, sphalerite in a gangue of barite) it is often possible to float the ore or the gangue and thus obtain a clean separation. Also, the use of differential flotation in separating mixtures of sphalerite and galena, or of sphalerite and pyrite, or of chalcopryite and pyrite, is proving of immense importance.

More recently it has been found possible to sulphidize carbonate ores of lead and copper by treating them with solutions of soluble sulphides or with sulphur vapor. These artificial sulphides seem to float as well as the natural sulphides. As some of the carbonate minerals have a tendency to slime very badly, this method of recovering them promises to be of much value.

Some gold and silver ores ordinarily treated by cyanidation can be treated more cheaply by flotation than by cyanidation, and with as high a recovery of gold and silver. It is also possible to recover in this manner the values in some ores which cannot be successfully treated by cyanidation. Thus for such ores

flotation is proving to be either a partial or a complete substitute for cyanidation. It is doubtful whether flotation will ever completely displace the cyanide process, because the latter produces metal for shipment, whereas the flotation process ordinarily produces only high-grade concentrates for sale to the smelters.

IMPORTANCE OF FLOTATION

In the light of the above statements it can be seen that flotation has justly assumed vast importance in metallurgy. The quick turn that American metallurgists took in favor of the process is significant of the developments of the past two years. Until then flotation processes had been held in considerable question. At present they are almost universally recognized as the best means of preventing slime losses, and there is a decided tendency toward the application of flotation methods in the retreatment of low-grade and complex ores. Accumulations of ores, which for one reason or another have been too difficult to handle in the past, are now being treated by methods which involve flotation, and at this time it is difficult to predict how far flotation will prove to be a solution of such problems as those above mentioned.

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University of Missouri, Rolla, Mo., and published as Bull. 1, Vol. 8, University of Missouri, Jan., 1916, 106 pp. This paper includes brief abstracts of important British and United States patents covering flotation processes, and a bibliography of litigation.

The Bureau of Mines and the Missouri State School of Mines are tentatively planning—last mentioned to cooperate in keeping this "General Bibliography" up to date—issue of supplements and revised re-editions when necessary.

BUREAU OF MINES URGES USE OF STRONGER DETONATORS

The Bureau of Mines, Department of Interior, Washington, D. C., in its bulletins and technical papers bearing on the use of explosives, recommends the use of nothing weaker than No. 6 detonators (blasting caps and electric caps), which recommendation together with reports from the various powder companies regarding unsatisfactory results obtained by users of explosives when detonators weaker than No. 6 are used, led the Institute of Manufacturers of Explosives (which is composed of practically all the powder manufacturers in the East) to ask manufacturers of detonators to make nothing weaker than No. 6. The Du Pont Company in a communication to the MINING CONGRESS JOURNAL advises that it has promised to do this and as soon as the present stock of detonators weaker than No. 6 is exhausted, their sale will be discontinued.

Practically all high explosives manufactured today are of the relatively less sensitive type (and consequently safer), but as it is therefore necessary to use a powerful detonator (not weaker than No. 6) to ensure complete detonation, it should be self-evident that weak detonators reduce the blasting efficiency of the explosives and increase blasting costs.

The United States Government recommends stronger detonators; the Institute of Manufacturers of Explosives recommends stronger detonators; the powder manufacturers recommend stronger detonators.

WOLFLIN SUCCEEDS PAUL AS HEAD OF RESCUE WORK

Hugh M. Wolflin has been placed in charge of all rescue work of the Bureau of Mines, succeeding James W. Paul, who resigned from the bureau several months ago. In this position, Mr. Wolflin, under the direction of the Chief Mining Engineer, George S. Rice, has charge of the movements of the rescue cars, the training of miners in rescue and first-aid work, and of all of the Bureau of Mines rescue crews at disasters, cooperating with the State authorities.

Before assuming this position Mr. Wolflin was the engineer of the bureau in charge of the cooperative accident work with the State of California.

MINE WORKERS TOLD HOW TO GUARD AGAINST DISEASE

The "safety first" movement has become firmly established at most mines and needs no argument to defend it or to show why it is needed. The placing of danger signals, putting guards or bars around open places, care in the handling of explosives, and the many other precautions of "safety-first" work are all plain common-sense acts that should not require much explanation. That "an ounce of prevention is worth a pound of cure" is well demonstrated in the results obtained by the "safety-first" movement in preventing accidents, suffering, and death.

To impress the miner with the need of taking similar care to keep well is more difficult, because the need of such precautions is not so readily seen. A circular, one of a series of publications on health and sanitation in the mineral industries, just has been published by the Bureau of Mines in order to call attention to the causes and the symptoms of some dangerous diseases found in mining towns, how these diseases are spread, and what precautions the miner can take against them.

RESPONSIBILITY OF THE MINER

The miner, in common with other workers, has two dangers threatening him nearly all the time. One is injury and the other is sickness. Either one means loss of time, loss of money, suffering for him, and perhaps for his family, and even death, with a widow and children left without income. Miners are coming to realize that most accidents are unnecessary, that they can be prevented, and the "safety-first" movement has lessened them enormously. But most miners do not know that sickness is just as preventable as accident—often more so. Many risks incident to miner's work can not entirely be done away with, and some accidents will happen in spite of the utmost care; but as regards some of the disease that affect miners there need be absolutely no risk. If proper care and attention are paid to the means of preventing sickness, it can be avoided as easily as accidents. These are some of the points brought out by the report which is known as miners' circular 20.

In accidents the cause and the remedy are often easy to see, continues the report. For example, a bar which was supposed to be a guard for an opening is left down; a man walks by, falls in, and is hurt. The cause of the accident, the result, the remedy, and their relation one to another are plain. In many cases of sickness, the cause is not evident to most men, because they do not stop to consider how the disease is spread and fail to realize the ease with which it may be prevented. Once this is understood, the problem of preventing sickness will be simplified, as has been the problem of preventing accidents, and improvement will follow pre-

ventive measures in this case as surely as it has in the other.

The "safety-first" movement has made the miner feel that each man is responsible for not only his own safety, but the safety of all around him. The same principle is true in preventing sickness. Each person is responsible for not only his own health, but the health of those around him. When he neglects or breaks one of the common-sense rules of health he endangers not only himself, but his family and the men who work near him. This circular mentions some diseases that every year cause much sickness and death among miners and describes the precautions that should be taken to prevent such diseases from starting and spreading.

GERMS CAUSE MUCH DISEASE

Now, it is known that much sickness is caused by germs getting into the human system, and that the way to prevent disease is to keep the germs out. Germs are tiny living things; so small, in fact that they can not be seen with the naked eye. It takes 35,000 typhoid-fever germs side by side to form a line 1 inch long. Of course, then, a single germ can not be seen unless a very powerful magnifying glass or microscope be used.

Some people find it hard to believe that there are such things as germs, largely because they do not see them. Miners, however, do not have to see in order to believe. The miner has never *seen* fire damp, but he knows it exists; the miner accepts the testimony of his safety lamp. In a similar way with germs; people should accept the testimony of the microscope.

GERMS AND FILTH ALLIED

Because germs cannot be seen it is difficult to protect ourselves from them. If it were easy, there would be much less sickness. One precaution that is perhaps more helpful than any of the others is to avoid all things unclean. Real cleanliness means many things. It means clean water, clean yards, clean milk, clean food, clean houses, clean air, clean bedrooms, and clean bodies. Long before we had any knowledge of germs instinct warned us to avoid unclean conditions. Now we have learned that germs and uncleanliness are closely related.

The throwing off of waste poisons is one of life's processes. Not only must the waste poisons get out of the body, but they must be kept away. They should be removed from all possible contact with the body. Man cannot flourish in his own defilement.

In early times people did not remain in one place very long. They hunted and fished and then moved on, leaving behind their defilement.

If people cannot move away from the defilement they cause, it must be moved away from them. The wholesomeness and health-

fulness of the dwelling site depend upon how quickly the wastes are removed from near it.

MOSQUITOES

Sometimes old tubs, kegs, and buckets are kept near the kitchen door for holding rain water. These are not only unsightly but they furnish breeding places for mosquitoes, and *mosquitoes may cause sleepless nights, malaria, yellow fever, and skin diseases.*

If it is necessary to collect rain water, it will pay to buy a clean barrel. This should be raised a few inches off the ground to keep it from rotting and should be kept covered during the mosquito season. A little oil, enough to make a film on the water, will keep the mosquitoes from breeding and will not hurt the water for washing.

Tall weeds should not be allowed to grow in the yard or around the house, for they make good hiding places for the mosquitoes during the day. Such weeds may also hide tin cans half filled with water, decaying rubbish and garbage, and sometimes dead animals. Also weeds take the strength from the soil. They do no good and should be kept cut.

It should be remembered that mosquitoes will lay their eggs and breed in a very small quantity of water. Often little tin cans, broken dishes, or bottles which are scattered about the yard will hold enough rain water to furnish breeding places for mosquitoes after much money has been spent in draining swamps and filling in lowlands.

HOUSES SHOULD BE SCREENED

Every means should be taken to keep flies out of the house. Flies breed in and thrive on filth. Disease germs and filth are plastered upon their hairy legs. Don't permit flies to walk over the food. Just before that fly touched the butter it may have dipped its feet in the spit of a consumptive.

Keep your premises clean, screen your houses, and then swat the flies.

WATER

Nothing less than a plentiful supply of pure, wholesome water should be considered in planning the mining villages of the future. A water tap should be placed in every kitchen, and the water should be made safe at the outset rather than after an epidemic of typhoid fever has pointed out this need.

Many people appear to be willing to "take a chance" with their drinking water. In one large city during one year one person out of every 1,000 died from typhoid fever caused mostly by drinking polluted river water. Each citizen perhaps felt that he would not be one of the unlucky ones. If there were 1,000 glasses of water spread out before you, one of which contained an unseen poison which meant death, would you take a chance on picking up one of the safe 999 glasses?

Many people living in mining towns get their water from shallow wells, and the care of the well largely depends on the individ-

uals. The importance of many of the following suggestions will be understood if it is remembered that *water is a food*. It goes directly into the stomach, usually uncooked. Why should we not be just as particular with conditions around the well as we are about our dinner table?

ROCK DUST

Dust is not a disease, but it is the cause of disease. Any hard, sharp rock dust when breathed into the lungs, irritates and cuts them, making many small scars. These scars make the lungs less able to perform their proper duty. Besides, because of the constant irritation, the lungs become inflamed, and consumption is liable to develop. Men who breathe the hard rock dust constantly often get consumption. The constant irritation of the lungs weakens them and at the same time gives the seeds of consumption a good chance to grow. The dust breather is also more liable to fall a victim to the careless spitter than the man whose lungs are sound. If he gets pneumonia, his chance of recovery is not so good. The dust breather has to fight not only the effects of any lung disease he may get, but also the harmful effects of the hard rock dust, which is constantly adding to the ravages of the disease.

Working in dust, like exposure, is at times unavoidable, but a great deal, if not most of the dust breathing is due to carelessness on the part of the miner himself who does not realize the danger of so doing, or if he does is indifferent to it. It is another example of failing to keep up the bars around an open place. In dust breathing, however, cause and effect are not so plain—at least they do not seem so to the miner. But the relation is there just the same. The number of deaths from lung diseases among metal miners is much greater than among coal miners and is probably 10 times greater than it ought to be.

What can the miner do to avoid breathing dust? Water drills are being used more and more. In dry drilling with machines it is possible to lay the dust by water lines or by using a squirt gun and water from a bucket, but often men drill with the hole dry rather than turn on the water, because it spatters on them, or makes the place sloppy. If you are drilling overhead, and the water has to come back on you, wear a rubber hat and boots, and if necessary a rubber coat. This is a bother, but it is also a bother to observe all the rules of "safety first"—which save lives. A man working anywhere where there is much dust should wear a respirator if possible, and see that the respirator is in good condition. Respirators are clumsy and more or less of a nuisance, but it is better to wear one than to have consumption. Do not breathe hard-rock dust day after day, because if you do it will disable you in time. Men who can "eat rock dust"—like the men who can "breathe gas"—die young.

BILL REVISING MINING LAWS IS DISCUSSED

(Continued from page 210)

office, and also provides for recording the final declaratory statement or description of the claim as permanently located with the register and with the local county recorder if required by the State statute, making practically two public records of every mining location, as the States now very generally, perhaps with one exception, require a record of mining locations.

PROVIDES FOR REPEAL

Objection No. 8. The bill provides for an appeal from the land office in case it should refuse a patent for any reason, to the court of competent jurisdiction and if the court on the proof offered by the locator determines he is entitled to a patent it must be issued on the order and judgment of the court.

Objection No. 10. This objection is taken care of in the first place by a provision requiring an entry and payment within seven years from the date of permanent location, and in the second place, by preventing a relocation by any person for or in the interest of any locator or owner and by requiring a relocater to make and file with the proper register an affidavit to the effect that he is wholly disinterested and that the relocation is not made for or on behalf of, or in the the interest of any other person.

Objection No. 11. The tunnel locations as provided for in Sec. 2323 of the existing law is entirely abrogated, but a locator is given the option to construct a tunnel for the purpose of working and developing his location as made and marked upon the surface.

Aside from the provisions for meeting these specific objections the bill wisely provides that in any case where a locator has not made a discovery of minerals within the period prescribed by the bill, he may, on an *ex parte* application to the judge of the nearest court, obtain an order in the nature of a license extending the time for his exploration and discovery work.

AS TO PLACERS

Sec. 2333 of the existing law gives the right to a third person, under certain circumstances, to locate or hold a vein or lode within the limits of a placer claim. This has been the source of much trouble and disturbance and is entirely changed, and a placer location made in good faith carries with it all mineral deposits of whatever kind.

The present bill preserves the distinction between lode and placer claims and if the locator of a lode claim discovers placer ground, or vice versa, he must then change his location to meet the requirements of the law and adapt his claim as discovered to the proper surface location as provided.

This bill presents certain questions which the person interested in the mining enterprise must to some extent agree upon. These questions may be stated as follows:

1. Should the locator be limited to one claim 2,100 feet square?

2. Should the locator be limited to five claims 1,500 by 600 feet?

3. Should the locator be given one full year in which to make a discovery, in view of the fact that provision is made for an extension of the time for discovery?

4. Should there be any difference in the number and size of claims permitted to be taken?

5. Should the locations be limited generally or be limited to a State or to a particular mining district?

6. Should a locator be required to develop a claim as a condition for locating other claims?

7. Should any limitations be placed on extralateral rights, that is, on the right of a locator to follow his vein on the dip into the claim of another locator?

8. Should the right of a locator to follow his vein on its dip into the location of another be limited to junior locations only?

9. Should a locator be permitted a given time in which to swing his claim in order to obtain advantage of the dip of the vein after discovery?

10. Would it work a greater hardship on the prospector to limit him to the vertical planes of his original location with the possible limitation to a small part of the dip of a vein, than to give him the right to swing his claim, and thereby deprive third persons of the right of locating claims within the limits to which he would be entitled to swing his claim?

11. Should a locator be deprived of his extralateral rights on the expiration of any given period unless he is working his claim?

12. Should a locator be required to locate and develop his vein into and through another claim as a condition on which he could follow the vein on its dip?

If persons interested in the location and development of mining claims can arrive at an agreement to any reasonable extent on these questions, or on any of them, it may be confidently asserted that the bill will be revised and improved to conform to any conclusions that may be reached.

SUB-COMMITTEE NAMED

A sub-committee consisting of Representatives Foster, Taylor, James, Wickersham and Hamlin has been named to consider the Foster bill. The sub-committee will not begin considering the bill until an opportunity has given to hear from the mining men of the country with regard to the changes in the law which are proposed in the pending bill.

Representative Taylor, while he was one of the most determined exponents of the Commission which was to study the question of the revision of laws before undertaking legislation, is not allowing the failure of his bill to interfere with bringing the Foster bill to the attention of as many mining men as possible.

Mr. Taylor is sending to a large number of

mining men a copy of the bill and the following letter:

"You probably know that the American Mining Congress and nearly all associations of mining men in the United States have for the past ten years been vigorously urging Congress to pass a bill authorizing the President of the United States to appoint a commission of high-class practical mining men to go out and thoroughly investigate the operations of the mining laws and mining conditions throughout the Western States and Alaska, and make recommendations to Congress for amendments, and a revision and modern codification of our mining laws. Scarcely any changes have been made in the mining laws during the past forty years, and many provisions of those laws are generally looked upon by mining men as being now obsolete and not at all adapted to new metals or modern mining conditions. A great many prominent mining men and mining lawyers are firmly convinced that our mining laws seriously retard instead of aiding mining development in the West today; and many prospectors feel that present conditions hold out very little encouragement to them.

"In response to that sentiment I have had pending before Congress for several years a bill providing for the appointment of such a mining commission. I had it favorably reported in the last Congress, and the Senate this session passed a similar bill, introduced by Senator Smoot; but the House Mines and Mining Committee has, after an exhaustive hearing, refused by a vote of seven to six to approve either my bill or that of Senator Smoot, and in lieu thereof has appointed a subcommittee of five to investigate and consider the whole subject and make recommendations to the main committee, as soon as we can consistently. This action does not accord with the general desires of the West, and was over my vigorous opposition. However, that is the present sentiment of a majority of the committee, and the subcommittee is Foster, Taylor, Hamlin, James and Wickersham.

"I am not criticising the action of a majority of my colleagues on the committee. In fact, generally speaking, I heartily coincide with their principal objections to my bill, namely, that the country is getting tired of creating so many expensive commissions; and, moreover, if the metalliferous mining people know what changes they want, or what new laws they want, and will agree upon them and will let this committee know, it is our duty to enact promptly those laws without waiting indefinitely on the report of a commission. On the other hand, if the mining people have no concerted determination as to what they want, there is no reason for Congress appointing a commission, or doing anything else. Roosevelt appointed a mining commission and after they had worked a couple of years, Congress did not pay enough attention to it to have its report printed.

"Chairman Foster, with the assistance of

several prominent mining attorneys and practical mining men, has prepared a bill incorporating the main amendments to the mining laws that have been most generally recommended to the committee. That bill has been introduced by Dr. Foster as H. R. 12275. Our subcommittee has sent out a large number to all state and local mining associations for distribution. I have had nothing whatever to do with the preparation of the bill. It is a tentative draft only, prepared in that way for the use and convenience of the subcommittee, and we are sending it out over the country to all mining communities of the West and Alaska, and asking the mining associations and mining men, miners, prospectors and everybody who is interested, to consider the measure carefully, and all of these proposed amendments and frankly make recommendation to us upon the subject.

"While we are writing the entire West to consider this matter, I am personally especially interested in having every mining man in Colorado carefully investigate all these proposed amendments and feel free to criticise them in every way. My thought is that there may be something good in this bill, and if any of these amendments would be beneficial, and the mining men and attorneys will let me know, I will try to secure their adoption, and will at the same time try to prevent the adoption of all amendments that they deem unwise or unnecessary.

"The sentiment of the western states and different mining districts is widely different. Some states and districts want one set of amendments and others denounce those and want other amendments. We never can please all of them. My judgment is that Colorado will disapprove of most of these suggested amendments. But even if we disapprove of nine-tenths of them, that is no reason why we should not favor those, if any, that will aid mining development, and we may suggest others that are not contained in this bill. If Congress can pass any law that will benefit the mining industry, I know the committee is exceedingly anxious to do so. There is no use now of our talking about obtaining a mining commission from this Congress. So if there are any amendments of the mining laws that Colorado wants enacted, we have a possible opportunity of obtaining them in this bill. I feel a very great personal responsibility in this matter because of the fact, as you will observe, that with the exception of the Delegate from Alaska, I am the only one on the committee who resides west of Missouri.

"Owing to the far-reaching importance of this subject to the metalliferous mining interests of the West, I would like to see the press give the matter suitable mention so that all mining men, engineers, attorneys and the public generally may be fully advised of the situation. And I would be glad also to have the mining men know that I am exceedingly anxious to cooperate with them in every way I can in considering the subject. In other words, this is a commendable effort on the

part of the Mining Committee to render if possible an important service to the metalliferous mining industry, and I hope the West will study this Foster bill and then give me their opinion on it. That opinion undoubtedly will have great determining weight in the course of mining legislation for some time to come.

"The Committee desires to report this bill in some form before the close of this session of Congress, and I would like to have all objections and suggestions specifically stated in detail, with the reasons therefor, so that I can present them clearly to the committee and have them go into the printed records."

In referring to the Foster bill, providing for revision of the mining laws, the *Nation's Business*, the official organ of the Chambers of Commerce of the United States, has the following to say:

"The present laws defining the rights of miners upon the public lands, however well adapted to conditions at the time of their enactment forty years ago, have given rise to much litigation and have resulted in recent years in practical difficulties regarding the procedure by which various kinds of valuable deposits can be acquired. Last December representatives of a number of commercial organizations, societies of mining engineers and metallurgists, and government bureaus met in Washington and advocated a revision of all the laws under which mineral deposits on the public lands are acquired and worked. Subsequently, a bill creating a commission to make such a revision passed the Senate. The House Committee on Mining, however, decided against such a commission, and determined itself to attempt the task.

"On February 25 the chairman of this committee introduced a comprehensive bill which he himself has tentatively drafted. In a comprehensive way this bill endeavors to deal with extralateral rights, by which the owner of a mining claim now may follow a vein appearing on his ground to any distance in its diagonal downward course beneath adjoining claims, and which have given rise to many law suits, creates opportunity to explore for mineral deposits that do not appear at the surface, and makes numerous other changes in present law. It is understood that hearings will be held before this bill, or any other of like purpose, is reported from committee."

Attend Chemical Meeting

A number of scientific men connected with government bureaus attended the fifty-second meeting of the American Chemical Society held at the University of Illinois, April 18.

New Laboratory Equipped

A laboratory has been equipped at Salt Lake City by the Bureau of Mines for microscopic and mineralogic work relating to ore dressing and metallurgy.

NEW CALUMET LEACHING PLANT EXCITING INTEREST

Considerable interest is being shown in Washington in the new leaching plant under construction by the Calumet & Arizona Mining Co. on its New Cornelia property. As this plant represents the last word in progress along this line of treatment, special attention is being given to the details of its construction.

The leaching plant will contain eleven lead-lined leaching tanks each eight-eight feet square by fifteen feet deep. Each will have a capacity of 5,000 tons. There will be one sludge tank of the same dimensions. Each leaching tank will have its pumping equipment for the circulating and advancing of its solution at the rate of 8,000 gallons per minute. The leaching tanks will be arranged in two rows with a central structure between, which will support the conveyors conveying the ores to the tanks and the circulating pumps and necessary launders. After the copper is extracted from the ore and the tailings washed and drained, they will be hauled into cars by an excavator of the Hulett type. The tailings will be hauled to the dump in side-dump cars on the afternoon shift, the cars and locomotives used at the mine on the morning shift being available for this service.

The plant will have five wash-water and acid-solution storage tanks of 430,000 gallons capacity each.

There has been considerable falling off in the amount of development work at many of the copper mines of the country as practically all of the operators are engaged in mining and marketing as much ore as possible at present prices. While a few properties are being gutted, the tendency is not to keep development work so far ahead as would be the case under normal conditions. This applies particularly to the Michigan mines, according to information reaching Washington.

At Bingham development is of a different type and is being carried on practically as usual, reports to Washington indicate.

There are a large number of small copper properties being opened and the tonnage from these properties is already assuming considerable proportions. Reports from the Geological Survey indicate also that many copper properties which had been abandoned are now able to operate due to the more favorable price.

Reparation Awarded

In case No. 8021 of the Wilhoit Refining Company, of Springfield, Mo., vs. Missouri, Kansas & Texas Railway Co., the rate of 13 cents per 100 pounds charged for the transportation of crude petroleum oil in carloads from Cushing, Okla., to Joplin, Mo., was found to have been unreasonable and unjustly discriminatory to the extent that it exceeded 10 cents per 100 pounds. Reparation was awarded.

Recent Legal Decisions

ousting Jurisdiction of Court

The Iowa workmen's compensation act is not invalid because it ousts the courts of all jurisdiction to try controversies between employers and employees. Even if it did this, the acceptance of the act is elective and when rejected the full dispute between the parties may be submitted to a court by ordinary proceedings and tried in the usual manner; and while some rules of procedure are changed, some defenses are eliminated, and there is some change in the burden of proof, yet the objection is not sustained that on rejection of the act the courts no longer have jurisdiction to try suits for the injury of an employee. It is true that when the statute is accepted it does operate to take from the courts so much of the controversy as is determined by applying the statutory schedules through the agency of the statutory arbitrators; but it does not constitute an agreement for complete ouster of jurisdiction of the courts to provide by contract for the arbitration of special matters, leaving ultimate liability or non-liability to be settled by the courts. But the very basis of power to award compensation under the act is that its provisions must first be accepted and that the claimant must be an employee and that he must have sustained personal injuries arising out of and in the course of the employment and that the compensation shall be at rates fixed by the statute, and arbitration is only provided for when the employer and employee failed to reach an agreement in regard to compensation under the act. The utmost the statute does is to provide administrative machinery for applying rates of compensation fixed by the legislature as between the parties who have agreed to have the amount of compensation thus determined.

Hunter vs. Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1063, November, 1915.

Operator's Failure

The Iowa workmen's compensation act provides that where both the employer and employee reject its provisions the liability of the employer shall be the same as though the employee had not rejected it; but it contains another provision to the effect that if the employee rejects he must suffer, in his suit for damages for injuries, the employer's right to plead and rely upon any and all defenses, including those at common law, and the rules and defenses of contributory negligence and assumption of risk and fellow servant, with

perhaps certain limitations; and it is further provided that compensation under the act is to be awarded only if both have done what amounts to acceptance of the act. Construed as a whole the act does penalize the employee who rejects it and while the penalties imposed upon the employer and employee may not be precisely the same, yet this is not vital and does not sustain a broad charge that an arbitrary difference is created as to the consequences of conduct, which is, in substance, alike. But were it otherwise the police power may be invoked to sustain some differentiations in favor of the employee, on the theory that this is a method of protecting him for the public good against the actual inequality between him and his employer.

Hunter vs. Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1053, November, 1915.

Reckless Operation of Motor

A jerk in the operation of a motor and cars in a coal mine which is vile, unusual, and unnecessary, is evidence from which negligence on the part of the person operating the motor may be inferred.

Nebo Coal Co. vs. Barnett (Kentucky), 190 Southwestern, 79, p. 80, December, 1915.

Jerks of Motor

An injury received by an employee from an ordinary and necessary jerk in the operation of a motor and coal car in a mine is a risk assumed by the employee but an injury which results from a violent and unusual and unnecessary jerk does not arise from such assumed risk, and the jerk by a motor operating upon the coal cars which is violent, unusual and unnecessary may be evidence of negligence on the part of the person operating the motor; and where a jolt was received by a coal car thereby causing the injury complained of, was unusual, violent, and unnecessary, the miner suing for such injury is entitled to have his contention upon this subject submitted to and determined by a jury.

Nebo Coal Co. vs. Barnett (Kentucky), 180 Southwestern, 79, p. 80, December, 1915.

Gross Negligence

Under the Kentucky rule injuries which are caused to a miner or an inferior employee by the gross negligence of his superior employee, are imputed to the employer or mine operator, and such an employee does not as-

sume the risks of danger which arise from such gross negligence in an employee superior in authority to himself; but this rule is limited to the case where such superior employee has the immediate control of and supervision of the injured employee, and does not extend to cases where the superior employee's ordinary negligence causes injury to an inferior employee who is not immediately under his control and supervision.

Nebo Coal Co. vs. Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

NEGLIGENCE OF FELLOW

A miner or other employee, when he undertakes employment so far as the mine operator is affected, assumed all the risks from injuries to himself which are caused by the negligence, either ordinary or gross, of his fellow servants who are upon the same plane of equality as himself as to authority and engaged in the same work; and he likewise assumes all risks of injuries which may arise from the ordinary negligence of a superior employee in the same work as himself where the negligence does not result in death.

Nebo Coal Co. vs. Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

NEGLIGENCE OF SUPERIOR

The ordinary negligence of a superior servant which results in an injury to a miner, which does not produce death, cannot be imputed to the mine operator.

Nebo Coal Co. vs. Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

FELLOW SERVANT OF EQUAL GRADE

A mine operator is not liable to a miner for injuries incurred by him on account of the negligence, either ordinary or gross, of a fellow servant in the same work and occupying the same situation as to authority as himself.

Nebo Coal Co. vs. Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

INJUNCTION

A coal mining company is entitled to a temporary injunction restraining a mortgagee from foreclosing his mortgage executed by it on the purchase of a mining lease, where the mortgagee induced the complainant to purchase the lease and execute its note and mortgage on false and fraudulent representations that he would cause all liens against the mining property to be satisfied and fraudulently represented that certain bonds secured by a trust deed on the mining property matured in eighteen months, the time the defendant's note and mortgage should mature, and that complainant could thereby protect itself, and where the defendant as a further induce-

ment to complainant to purchase the mining lease and execute to him its notes and mortgage promised and agreed that the time on the note and mortgage held by him should in any event be extended until the date or after the date of the maturity of all indebtedness and liens against the mining property, and where it subsequently appeared that the bonds secured by the trust deed did not mature until two, three and four years from the date of the note and mortgage executed by the complainant and that the defendant refused to extend the time of the maturity thereof according to his promise and was in fact proceeding to foreclose his mortgage by advertisement, and the complainant is entitled on the facts stated and the fraudulent representations contributed as an inducement to the execution of the note and mortgage maturing as they did and a reformation of his note and mortgage in conformity with the defendant's promise of extension and an injunction restraining a premature foreclosure of such mortgage.

Consumers' Coal & Fuel Co. vs. Yarbrough (Alabama), 69 Southern, 897, p. 899, October, 1915.

DOES NOT INCLUDE GAS

An oil and gas lease executed upon a certain stated consideration provided further that the lessee was to pay to the lessor a certain stated sum within 90 days after a well for oil and gas is drilled and oil produced in a pipe line in paying quantities, and to pay a like sum within 90 days after each paying well thereafter is drilled until the payments amount in all to a certain stated sum, does not require the lessee to pay the stated sum where a well was drilled on the premises which produced gas only.

Ball vs. Freman (West Virginia), 87 Southeastern, 91, November, 1915.

CONVEYANCE TO TRUSTEES

A deed of land to nine persons named as trustees of a mining corporation does in effect convey the land to the trustees for the mining corporation and not to such trustees for their own benefit.

Troy & North Carolina Gold Mining Co. (North Carolina), 87 Southeastern, 40, p. 41, December, 1915.

DRAINING ADJOINING LANDS

While oil wells drilled and operated may, by reason of their proximity to a division line, in fact drain oil from adjoining lands, yet such operations, in the absence of special circumstances or relations between the parties, offer no basis for a claim to a share in or an accounting for the oil so produced, or for a receivership for the operation of the wells so drilled.

Cain vs. South Penn Oil Co. (West Vir-

ginia), 86 Southeastern, 883, p. 885, October, 1915.

See *Fairbanks vs. Warrum* (Indiana Appeals), 104 Northeastern, 983, p. 986.

FRAUD NOT IMPUTABLE

A lessee who obtained an oil and gas lease from the owner of land and who was unable to obtain a lease from the adjoining land owner, is not to be charged with fraud by the latter and is not liable to such adjoining land owner for any part of the oil produced by him from wells on the leased land, though located so near the line as to drain the oil from the adjoining premises, and the mere execution of such a lease causes no inference of fraudulent intent and justifies no implication of a purpose on the part of the lessee to wrong the adjoining land owner.

Cain vs. South Penn Oil Co. (West Virginia), 86 Southeastern, 883, p. 885, October, 1915.

See *Fairbanks vs. Warrum* (Indiana Appeals), 104 Northeastern, 983, p. 986.

EVIDENCE TO SUPPORT VERDICT

Where a mine owner and operator had mined out and completed according to his plan of work certain entries or rooms in its mine, the evidence of an injured miner to the effect that he was expressly directed to enter such abandoned part or room, without any knowledge on his part that it had been so abandoned and where there were no sufficient visible indications of its abandonment, and was there injured in the course of his employment, is sufficient to sustain a verdict in his favor as against a demurrer to the evidence.

Osburn vs. Darby Coal Mining Co. (Virginia), 86 Southeastern, 834, p. 835, November, 1915.

FAILURE TO WARN MINER

A mine owner and operator has the right to abandon places in his mine which have been completed according to the plan of the work and if a room in which a miner was directed to work had been abandoned, there being no sufficient visible indications of its abandonment, the mine owner would be liable for negligence to a miner entering such abandoned part or room and was injured in the course of his employment, if the mine operator failed to give due and timely warning of such abandoned part or room.

Osborn vs. Darby Coal Mining Co. (Virginia), 86 Southeastern, 834, p. 835, November, 1915.

SALE OF PROPERTY

Where a corporation organized for the purpose of operating mining claims owned by it, sold and transferred all its mining claims and where it has ceased to do business and its

property is liable to be wasted, a receiver is properly appointed to wind up the corporation.

Murphy vs. Utah Mining, Milling & Transportation Co. (Maine), 95 Atlantic, 887, p. 888, December, 1915.

DISSOLUTION ON ORDER OF COURT

A mining corporation is properly dissolved by a court on application of a stockholder where by reason of the gross mismanagement of its affairs it was in imminent danger of insolvency and danger that the estate and effects would be wasted, and because it had ceased to do business.

Murphy vs. Utah Mining, Milling & Transportation Co. (Maine), 95 Atlantic, 887, p. 888, December, 1915.

FREEDOM FROM NEGLIGENCE

The Iowa workmen's compensation act provides that the only negligence of an injured employee which is available as a complete defense in negligence which is self-inflicted or injury which is the result of intoxication; but the employer is at liberty to prove that, either by reason of the negligence of the plaintiff, or for any other reason, he was wholly free from fault. While under the act it was to be presumed that the proximate injury of the employee was the direct result of negligence on the part of the employer, and the burden of proof is cast upon the employer to rebut this presumption, and to show affirmatively that no negligence of his caused the injury. The rules as to presumptions and burden of proof are court-made and can be changed or abrogated by the legislature; and if the court could place the burden on the injured employee to prove his freedom from contributory negligence, the legislature may abolish this rule and place the burden upon the employer to show that he was not negligent.

Hunter vs. Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1065, November, 1915.

CONTRIBUTORY NEGLIGENCE

The Iowa workmen's compensation act abolishes the doctrine that an injured miner cannot recover because of contributory negligence on his part, however slight, though the negligence of the operator may be great or gross. But the statute has in fact added to the defense of contributory negligence rather than subtracted from it, and but for this statute all contributory negligence would be available in mitigation of damage, and under this statute there is a right to plead it in mitigation, plus the right to plead some contributory negligence in bar and recovery may be defeated by showing the employee's willful intention to injure himself or where the intoxication of the employee was the proximate cause of the injury. But in any event a stat-

ute abolishing such defenses as contributory negligence, assumption of risk, and the negligence of fellow servants, only where the employer being free to accept or reject the statute, violates no constitutional rights.

Hunter vs. Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1066, November, 1915.

TRIAL BY JURY

The Iowa workmen's compensation act does no accomplish a denial of the right of trial by a jury and particularly in cases where the employer rejects the compensation statute; and the fact that the statute accomplishes giving the jury less to do than formerly, and changes the character of its work, in that a jury will no longer consider whether the employee should be defeated because the evidence shows he assumed the risk of being injured as he was and can not consider the question as to whether the alleged injury was due to the negligence of a fellow servant nor whether the injured employee has proved that his injury is due to the negligence of the employer, but begins its inquiries by assuming the employer was negligent and then considers whether the employer has proved, notwithstanding this presumption, that he was wholly free from fault. It is clear that this does not deny trial by jury, but merely changes the rules under which such trial shall proceed.

Hunter vs. Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1066, November, 1915.

WORKMEN'S COMPENSATION

The Iowa workmen's compensation act is not subject to the charge of unconstitutionality on the ground that it compels an employer to accept its provisions and then deprives him of certain rights. The statute does not compel acceptance, but it does provide that the presumption that the employer has elected to accept its provisions prevails unless certain prescribed notices are given by him, but this does not compel him to accept the act, but is merely a provision as to what he must do to avoid a presumption that he has accepted it; and the claim is wholly immaterial where a complaining corporation concedes that it has rejected the provisions of the statute.

Hunter vs. Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1068, November, 1915.

DISADVANTAGE OF EMPLOYEE

The provision of section 3 of the Iowa workmen's compensation act as to the presumption arising when an employee rejects the benefit of the act and the provision of section 19 as to the presumption of fraud in a contract of settlement made by an injured miner, cannot be said to interfere with the right to contract, as the



NEW BREATHING APPARATUS
Developed by the Bureau of Mines

legislature having power to enact a valid compensation act always has power to make provisions against having the legislative intent as to such act thwarted, and to put the ban on such influences interferes with no right of contract, but simply heads off methods of evading and crippling the act. One underlying purpose of the act is to promote acceptance by the employee of the benefits of the act and the provision of section 19 is an attempt to prevent fraud in dealing with an injured employee and is intended to guard against the nullification of the act through the employer's obtaining a contract to the disadvantage of the employee when he may be physically and financially in distress; but the act does not in fact prevent or make void the contract but only makes it presumptively fraudulent, merely changing the burden of proof as to the validity of such contracts.

Hunter vs. Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1050, November, 1915.

New Mexico Coal Rate Suspended

The proposed increase in rates on coal from Raton and other points of origin in New Mexico to certain stations located on the Trinity & Brazos Valley Railroad, has been suspended until October 8.

Current Traffic Developments

Hearings of interest to the mining industry are under assignment by the Interstate Commerce Commission as follows:

Washington, May 1. Examiner Marsh. 8725. Lake cargo coal rates. 8598. Pittsburgh Coal Operators, Association *vs.* Pennsylvania Company.

Washington, May 15. Oral argument. 6890. Coal Operators Traffic Bureau of St. Louis *vs.* Terminal Railroad Association.

Washington, May 17. Oral argument. I. & S. 740. Coal to Missouri stations.

In case number 7921 of the Progressive Metal & Refining Company *vs.* the Chicago & North Western Railway Company the commission found that the rate charged for the transportation of scrap copper and scrap brass in carloads and of scrap brass and slab zinc dross in mixed carloads from Chicago, Ill., to Milwaukee, Wis., is unreasonable. A reasonable maximum rate was prescribed for the future. Reparation was denied.

In case No. 7853 of the Oklahoma Fuel Company *vs.* Fort Smith, Poteau & Western Railway Company, the commission found that the charges collected for the transportation of one carload of coal from Whiteville, Okla., to Gould, Okla., reconsigned to Wellington, Tex., and returned to Gould, not to have been unreasonable. The complaint was dismissed.

Pennsylvania Request Denied

Application for authority to establish rates on bituminous and cannel coal from points on the Pennsylvania Railroad and its connections to water competitive points on the Maryland-Delaware peninsula lower than rates contemporaneously applicable on like traffic to intermediate points has been denied.

Demurrage Charge Refunded

In case No. 7694 the C. Reiss Coal Company, of Sheboygan, Wis., *vs.* Ann Arbor Railroad Company, demurrage charges, due to inadvertent cancellation of free-time provision, collected on coal in carloads held for reassignment at Frankfort, Mich., were found to have been unreasonable and reparation was awarded.

Prescribes Maximum Rate

In case No. 7933 of the Consolidated Fuel Co., of Hiawatha, Utah, *vs.* Atchison, Topeka & Santa Fe Railway Co., the commission finds that the defendants' rates for the transportation of soft coal in carloads from Mohrland and Hiawatha, Utah, to California points on the Atchison, Topeka & Santa Fe's branch line from Los Angeles, Cal., to National City, Cal., to be unreasonable. A maximum joint through rate of \$6.65 per net ton is prescribed.

Makes Nondiscriminatory Rates

In case No. 7804, of E. Rickards, of Norfolk, Va., *vs.* Seaboard Air Line Railway, the rates for the transportation of mine-prop logs in carloads from Thelma and Vaughan, N. C., to Portsmouth, Va., were found to have been unreasonable and unjustly discriminatory. Reasonable and nondiscriminatory rates were prescribed for the future.

"SAFETY-FIRST" EXPOSITION

READY FOR ITS TOUR

Arrangements have been completed by the government to send out May 1 a traveling exposition of "safety first," consisting of twelve steel cars filled with exhibits showing the work of the various Federal bureaus along humanitarian lines.

Space in the "safety first" special is divided among the exhibits of the Bureau of Mines, the Public Health Service, the United States Coast Guard, the Forest Service, the Navy and War Departments, the American Red Cross, the Weather Bureau and other Government agencies. Motion picture shows, depicting the work of the United States, will be given aboard the train every evening.

The train eventually will traverse most of the United States.

WESTERN LIGNITES OFFER PROMISING FUEL SOURCE

To one thoroughly familiar with the great extent of the western lignite deposits, their limited development, and the comparatively simple methods that have thus far been adopted in their utilization as fuel, any investigations looking to a possible and increased utilization of these vast deposits must at once be considered of great economic importance. There is no doubt that much can be done toward improving the methods of burning now in use, and in providing means for using the coal in other forms, such as in a pulverized state, or in the manufacture of producer gas, or of by-product gas, or as residue briquets. Especial attention has been given by E. J. Babcock, of the Bureau of Mines, to the study of utilizing the lignite in the form of residue briquets and in the manufacture of by-product gas, because in this method there appear excellent possibilities of providing a satisfactory and efficient fuel and of recovering numerous by-products.

From the results obtained by the methods being developed at the school of mines and the substation of the University of North Dakota there seems little doubt but that the briquetting and the production of gas from lignite can in the near future be put on a commercially satisfactory basis.

CALIFORNIA INSPECTOR OPENS CORRESPONDENCE WITH MINERS

Edward Higgins, State mine inspector of California, sent out the following letter, under date of March 15, to every mine worker in his State:

"Maybe you will not be looking for a letter from me, but I have a good reason for writing. I want to get in close touch with you and this is the only way I can do it. I hope you will read this to the last word. If you do not you will miss the 'Safety Bear.' I believe that every one of you, except he whose strength is entirely below his Adam's apple, will agree with what I am about to write.

"You have all heard of the great safety wave that has been sweeping over this country of ours. You know that the Federal and State governments, various societies and many mining companies are putting forth efforts to reduce accidents in the mines. In many mining districts this safety wave has already drowned out a large per cent of accidents, and that is good for the miner.

"In talking about safety with men in the mines I have often heard the remark: 'What's the use? What do we get out of it? The company is the only one that is benefited.' Now, right here is where a big mistake is made. I submit that the miner is far and away the greatest gainer from safety work.

"Here are the facts: The governments and societies spend large sums of money every year in trying to make the mines safe, but there is no way for them to get a cash return for their efforts. Mining companies also are spending many hundreds of thousands of dollars yearly for the same object. Those that carry casualty insurance have little to gain. It is true, however, that those companies carrying their own insurance do save money by reducing accidents to employees. What if such companies do save a little money? It is not a drop in the bucket when placed side by side with the reduction of misery and suffering to the miner and those who depend on him.

"What is compensation? You who have a family: is there anything that can compensate you for the loss of your life, for the loss of a leg, or a hand, or the mutilation of any other part of your body? Is there anything that can compensate you for walking around on a wooden leg, or for having to stand on a corner with a tincup tied around your neck asking help because you are blind? You who have not yet married, what chance have you to secure a loving wife with your looks spoiled by a blasted face, or by the loss of half of your teeth, or an eye, or an ear? There is no money compensation for such injuries.

"The day is coming soon when the mines in this State will be made as safe as possible. The work may be slow—but it is sure. Now, while I believe it is a great thing to have the mines put in a safe condition, I am a firm believer in the fact that safety in mines

cannot be had without the active help of you miners. What good are safety devices if men will not take care of themselves? I hold that almost the whole problem is up to you boys. Don't take this for criticism, for it is not meant that way. The average miner is careful, but you know, as I know, that there are many careless miners.

"I want you to know that all of the deputy mine inspectors and I have served time below the collar, and that the business end of a muck stick is no stranger to any of us. It follows that we should 'savvy' many things from the standpoint of the miner. As a matter of fact, we not only know what you are up against, but we have a most earnest desire to make things better for you and we are working faithfully toward that end. In other words, we are for you. Without a shadow of a doubt, however, unless you assist us, all of our efforts will avail but little. It would be a great pleasure for me to know that every miner of this State is in sympathy with the work of this office, and I can promise you that the result of such a condition will be a reduction of accidents such as no State in the Union can show. Let us do this thing. The benefits and the credit will be yours.

"The books of the Miners' Safety Bear Club are now open for the entry of members. I would be glad to have every miner in California join this club. Its only constitution is 'Safety First'; its by-laws are 'Think Before You Act'; there are no dues. In order to join it is only necessary for you to send your name to me. It would be a simple matter for some one miner at every mine to make a list of those who wish to join the club. On receipt of such a list I will enroll the names and will send, without cost, to each miner a neat 'Safety Bear' button, which will signify that the wearer is a 'bear' for safety. I cannot too strongly urge you to join this club. The benefits are too numerous to mention. In the words of the oracle: 'Get aboard while you have your health.' The first 50 names received will be enrolled as charter members. Those who send in the lists will be given honorable mention in the next letter.

"If you have time I would be glad to hear from you, telling me if you like this letter and the 'Safety Bear' movement. There will be other letters as the months go by and every effort will be made to make them of interest and value. Let's get together and make this thing a go.

"In closing I am going to add a few thought blasts which I recommend for your consideration. Some of them will amuse you and others will benefit you."

THOUGHT BLASTS

A first aid man who knew it all was asked: "How would you treat one of your mates who had been badly frostbitten?" The know-it-all responded promptly: "Why, rub him with a man who had a touch of sunstroke."

Look out for the other man, you might hurt him.

Recklessness is no indication of courage; brave men are always cautious.

Ty Cobb says: "No, I do not drink; it dims my batting eye."

Never do anything that you know is dangerous in order to show someone else that you are not afraid to do it.

Look out for the greenhorn and show him how to keep from getting hurt.

Get the safety habit—it is the only habit which will never injure you.

A broken rule usually means a broken bone.

A rusty turned-up nail is in the same class as a poisonous reptile. Turn them both down.

Dynamite or airships are not the most dangerous things in the world. The slipping ladder causes approximately 6,000 deaths and 200,000 accidents every year in the United States. The ladder, carelessly used, is one of the most dangerous things in the world.

MISCELLANEOUS MINERAL MINES REPORT FEW ACCIDENTS

The reports of 240 operators of miscellaneous mineral mines show that these mines employed 9,249 men, of whom 2,465 were employed underground and 6,784 on the surface. The total number of deaths and injuries due to accidents reported is as follows: Deaths, 27, or 2.92 per 1,000 employed; serious injuries, 128, or 13.84 per 1,000; and slight injuries, 596, or 64.44 per 1,000. When compared with the rates for the copper and iron mines, these ratios seem exceedingly low. The reports received indicate that this difference is largely explainable by the mines being small and not keeping complete records, says Albert H. Fay, statistician of the Bureau of Mines. Most of the mines are in States where there are neither State inspection nor compensation laws, and operators are not obliged to keep accident records or to report accidents. Furthermore, about 75 per cent of the men are employed on the surface, the hazards being thus reduced to those of quarry operations. The figures for 1914 show a higher injury ratio than for previous years, indicating that the educational campaign is resulting in more complete records being kept.

CONSERVATION MEETING OF INTEREST TO MINERS

Of considerable interest to mining men will be the conference on the development of national strength and efficiency, to be held by the National Conservation Congress at Washington May 2, 3 and 4.

Since the meeting is called largely with the idea of discussing the mobilization of national resources much attention is to be given to the mining side of the proposition. A number of prominent mining men have indicated their intention of being present.

UTAH MINING DISTRICTS TO BE REPORTED UPON

A detailed investigation of the Cottonwood and American Fork mining districts of Utah have been given first place on the geologic schedule of Utah by Dr. George Otis Smith, director of the Geological Survey. This step was asked in a petition by members of the Utah chapter of the American Mining Congress. Referring to this matter Dr. Smith says:

"All plans for topographic and geologic work for the coming field season are still in the tentative stage. The detailed investigation of the Cottonwood and American Fork districts have been given first place on the geologic schedule for field work in Utah, and it is hoped that work can be started this spring. It will be necessary as a preliminary to this investigation to map on the "mile" (1: 62,500) scale considerable country adjacent to the area covered by the published Cottonwood Special Map, and to extend that map about two miles farther South. It is planned to have the geologists follow up the topographers closely on this work.

"Although every effort will be made to secure prompt results I am afraid that many of the petitioners do not realize that the kind of survey and publication for which they are asking cannot possibly be completed in anything like so short a time as the brief reconnaissance report already issued on the district."

A. S. AND R. INTERESTED IN SAMPLES OF TIN ORE

Since several inquiries have been received at the office of the American Mining Congress as to what facilities are offered by smelters for the examination and analyzing of ores, it perhaps will be of interest to know the attitude of the American Smelting and Refining Co. with regard to this matter.

"We only examine and analyze ores," says W. E. Merriss, secretary of the American Smelting & Refining Co., "submitted to us in cases where the parties are in position to negotiate for sales of stated tonnages for the use of our plants. Our laboratories are so crowded with work that we are not in position to do a general assaying simply for information of prospectors and others.

"As to tin ores, our capacity for some months ahead is already provided for under contracts already made. However, we should be interested in receiving samples of high-grade tin material, with a view to securing information as to future supplies of a suitable material. Any of your correspondents who may wish to submit such samples should forward them by mail or express to American Smelting & Refining Co., Maurer, N. J., with advice to that address and to 120 Broadway, New York."

WASHINGTON SHOWS GREAT INTEREST IN REPORT ON RITTMAN DISCOVERIES

**Bulletin Issued by Bureau of Mines Gives Details of Experiments That Have Attracted
Attention Throughout the World—Large Scale Experiments Fully
Confirm Results Obtained in Laboratory Work**

Much interest is being shown in Washington in the report of W. F. Rittman, of the Bureau of Mines, on his experiments and discoveries with regard to refining processes.

Some of the conclusions drawn by Mr. Rittman follow:

It appears that all the products of petroleum from the lightest distillates to the heaviest residuum, including heavy crude oils of an asphaltic nature, such as crude Mexican and California oils, can be successfully cracked and large yields of gasoline hydrocarbons obtained.

It should be noted that the production of gasoline hydrocarbons from a given quantity of original oil is not limited to the first run, but that the residuum above the gasoline fraction can be rerun through the furnace and a like proportion of cracked gasoline obtained. The process may be repeated until finally 50 to 60 per cent of the original oil can be converted into gasoline, as has been repeatedly demonstrated with the small laboratory apparatus used by the authors.

The favorable conditions for gasoline formation seem to be moderate temperatures and high pressures. In commercial work, a temperature ranging between 500° and 550° C. and a pressure of 12 atmospheres and upward will be found suitable, as high a pressure as can be maintained within the limits of safety being desirable, because of the improved quality of the gasoline.

The large-scale experiments have fully confirmed the laboratory experiments and established the fact that the conversion into gasoline can be even more satisfactorily accomplished in a tube of greatly enlarged diameter and increased length than in the electrically heated 1½-inch tube. The conditions favorable for gasoline production are shown to be the same in the larger tubes as in the small tube, namely, a temperature of approximately 500° to 575° C. and a pressure of 250 to 300 pounds per square inch.

The gasoline process, therefore, can justly be considered as a success so far as conversion in the large tubes is concerned. The adaptation of the unit to refinery conditions is a matter of mechanical detail involving no inherent difficulties.

AROMATIC HYDROCARBONS

The data given establish that, as in gasoline formation, all types of petroleum oils,

from light distillates to the heaviest residuum, including heavy asphaltic-base oils, can be made to yield aromatic hydrocarbons in commercial quantities. The residuum above the lower-boiling aromatic fraction can be rerun, and the aggregate yields from a given quantity of original oil can be proportionately increased.

The favorable conditions for aromatic formation seem to be high temperatures and moderate pressures. In commercial work a temperature ranging between 625° and 700° C. and a pressure of upward of 8 atmospheres will generally be most suitable.

LABORATORY EXPERIMENTS

The results of the experiments led to the following conclusions:

In procuring the desired products of the cracking reaction, the physical and chemical properties of an original oil are of secondary importance compared with the influence of temperature, pressure, time, and concentration.

Under like conditions, practically identical results have been obtained from five different oils, and the differences reported may be attributed, in part, as much to variation in rate of reaction as to the actual production of dissimilar equilibrium products. One exception noted relates to the production of carbon, a residual product, the formation of which seems to be proportional to the quantity contained in the original oil. Viscosities and specific gravities of the oils obtained show in some measure the influence of the properties of the original oils, but the differences are only slight and can perhaps be explained by the system not having been allowed to reach complete equilibrium.

The experiments have indicated the commercial possibilities and advantages of hydrocarbon reactions carried out in a cracking chamber composed of a vertically arranged tube, when the products to be treated are in a gaseous state and are cracked in an atmosphere of decomposition products. The results obtained with large-scale equipment, subsequently described, have demonstrated the correctness of these conclusions.

MULTIPLE-TUBE FURNACES

Observations of the results obtained in a single-tube furnace as compared with those obtained in the 10-tube furnaces have demonstrated the superiority of the single-tube over the multiple-tube arrangement.

No difficulty was experienced in maintaining temperature control over the single tubes, whereas it has been a constant problem to obtain anything like uniformity of heating conditions with the multiple-tube furnace. To get a uniform heat over a small area of the tube it must be heated on more than one side by burners near one plane. This is not possible in the multiple-tube furnace, but is easy of accomplishment in the single-tube type. One side of the tube in the multiple furnace often becomes too hot and the other side too cold. This would not be the case with the smaller installation.

Separate compartments for each tube would, it is believed, be as satisfactory as single-tube furnaces if sufficient combustion space were allowed. The cost of construction would naturally be less if a number of these compartments were constructed as a unit. It is not recommended, however, that more than four such compartments be arranged in a single unit.

Another recommendation in favor of the single tube is the fact that accurate observation of heating conditions is permitted, which is impossible in the multiple type. With the single-tube furnaces a proportionally much larger combustion space can readily be obtained. The larger combustion space will permit a better mixture of the gas and air and will tend to give more uniform heat conditions, owing to the greater distance the products of combustion must travel before reaching the tubes. An outer combustion chamber in which combustion takes place before the gases enter the furnace chamber in which the single tube is set would enable the brickwork in the interior of the multiple furnaces to be dispensed with without any change in the results.

Independent operation of the tubes would permit a tube to be removed or replaced without interfering with the operation of the other tubes. This is difficult in the case of a nest of tubes in a multiple furnace.

REGARDING CONDENSERS

In any new installation for the employment of this process, provision should be made for a condenser of the same type as that used in oil refineries. With the benzene-toluene process, the condensation problem is, however, markedly different from that of the refinery where all the vapors coming from the still are condensable, as in making benzene and toluene considerable volumes of fixed or noncondensable gases are generated. In general a condensing area of approximately $2\frac{1}{2}$ feet for each barrel of original oil used per day will be found satisfactory if a gas scrubber is operated in connection therewith. This gas scrubber can be modeled after the benzene scrubbing towers in by-product coke-oven plants, or may consist merely of a large tank filled with a heavy oil through which the gases are bubbled. This tank should be so inclosed that the fixed gases can be con-

ducted to a gas holder for the purpose of supplying fuel for the furnaces, if desired. In by-product coke-oven practice the introduction of back pressure by forcing gas through a body of oil would seriously affect the coking products, whereas in the process herein described there is sufficient direct pressure to work against any desired head of oil.

NORTHWEST MINING CONVENTION PRAISES LANE AND TALLMAN

The Northwest Mining Convention has adopted the following resolution, recognizing the efforts of the Secretary of the Interior and the Commissioner of General Land Office in Expediting Patents:

Whereas, It is common knowledge in the mining industry that for the past eight or nine years the process of securing United States patents to mineral claims has been slow, cumbersome and expensive, and much beyond the reasonable time and means of the prospector or the young mining company to finance; and

Whereas, Such process has within our knowledge seriously impeded mineral discovery on the public domain, and

Whereas, It has come to our knowledge that the Hon. Franklin K. Lane, Secretary of the Interior, and the Hon. Clay Tallman, Commissioner of the General Land Office, appreciating this state of facts, have succeeded in materially reducing the length of time required for securing patents, greatly to the benefit and encouragement of prospecting and mining. Be it, therefore,

Resolved, That this convention, in mass assembled, express its deep appreciation of the efforts of both the Honorable Secretary of the Interior and the Honorable Commissioner of the General Land Office in behalf of expeditious and businesslike methods in the issuance of mineral patents. Be it further

Resolved, That copies of this resolution be transmitted to the Secretary of the Interior and the Commissioner of the General Land Office.

The Dorr Company Formed

The expansion of the business and professional service of the Dorr Cyanide Machinery Company, due to the increasing use of Dorr machinery in so many varied processes, has necessitated an enlargement of its engineering staff and facilities and made advisable the incorporation of the Dorr Company.

The Dorr Company takes over the patents and commercial business of its predecessor, and will act in a consulting capacity in connection with the design, construction and operation of hydrometallurgical, wet chemical and allied industrial plants and the conduct of technical investigations, according to an announcement from the Denver office of the company.

Current Federal Legislation

A total of 20,735 bills have been introduced thus far at this session of Congress. Of this number 14,999 are House bills and 5,736 are Senate bills.

Owing to the presence of the appropriation bills and the President's program before Congress no bills of interest to the mining industry were reached by either House during the last month.

The greatest activity has been displayed by the House Committee on Indian Affairs, which is considering a number of the mining problems which arise on the Indian lands in Oklahoma and other states. Hearings have been conducted, but none of the bills had been reported out April 25.

The House Committee on Mines and Mining has held no session of the full committee, but Dr. Foster, chairman of the Committee and several members of the Committee have been active in trying to get before the mining men of the country the bill in which it is proposed to make certain changes in the mining laws. The sub-committee of the Committee on Mines and Mining, of which Representative James is chairman, is conducting hearings on Representative Randall's H. R. 175.

The Senate Committee on Public Lands has reported favorably on the Oil Land Leasing Bill, which is now on the Senate calendar, but with little prospect of it being considered at an early date.

The Senate Committee on Indian Affairs also is considering several bills with reference to mining leases on Indian lands.

The Senate Committee on Mines and Mining has held no meeting during the month, and no bills in addition to those mentioned in this column last month have been referred to it.

Senator Sheppard has served notice that he will offer an amendment to the Sundry Civil Appropriation Bill, providing for a special investigation of lignite.

The object of the bill is to secure information as to the most efficient treatment and use, especially with reference to their utilization in producing fuel for internal-combustion engines, and in supplying benzene, toluene, and other basis materials required by the dye-stuff, explosive and related chemical industries. The sum of \$50,000 is provided for the purpose.

S. 4825, by Mr. Owen, of Oklahoma. This bill provides for the sale of coal and asphalt deposits in the segregated mineral land in the Choctaw and Chickasaw Nations in Oklahoma. The bill is pending before the Senate Com-

mittee on Indian Affairs, and early action by the committee is anticipated.

Bills pending before the House Committee on Mines and Mining are as follows:

H. R. 174, by Mr. Mondell, of Wyoming. The bill provides for the reservation by the United States of the preference right to purchase radium-bearing lands on the public domain. No action has been taken by the committee on this bill.

H. R. 182, by Mr. Mondell, of Wyoming. The bill provides for a mine experiment station at Lauder, Wyo. This, along with all other bills providing for mine experiment stations, is being held in abeyance at the request of the Secretary of the Interior. Ten experiment stations have been authorized by law and arrangements have been made for an appropriation covering the establishment of three of them this year. In view of the fact that the government has embarked upon a policy of establishing mine experiment stations, it is the desire of the secretary that no separate bills providing for such stations be considered. The probabilities are that bills for the experiment stations will die in committee.

H. R. 294, by Mr. McCracken, of Idaho. This bill provides for a mine experiment station at Moscow, Idaho.

H. R. 10830, by Mr. Foster, of Illinois. This bill provides for the uniform selection and purchase of fuel to be used by the United States. It has been referred to the departments, where, it is understood, it is meeting considerable opposition. The plan is to have the Bureau of Mines adopt a scientific fuel standard and superintend the purchase of coal for government use, but this would encroach to some extent on the purchasing divisions of the departments, which is said to be the real cause of the opposition. Dr. Foster, however, has been collecting some data in regard to the haphazard manner in which fuel is being purchased by the government at present. He will push this bill regardless of the opposition from the departments.

H. R. 671, by Mr. Austin, of Texas. The bill provides for the use of the proceeds from certain mineralized public lands for the endowment of schools.

H. R. 4669, by Mr. Hawley, of Oregon. The bill provides for a mine experiment station at Grants Pass, Ore.

H. R. 5802, by Mr. Edmonds, of Pennsylvania. The bill provides for the codification and revision of the mining laws.

H. R. 6043, by Mr. Raker, of California. The bill provides for the codification and revision of the mining laws.

H. R. 12121, by Mr. Langley, of Kentucky. The bill provides for the establishment of a mine rescue station and a station for analyzing and testing coal at Jenkins, Ky.

H. R. 12884, by Mr. Carter, of Oklahoma. The bill authorizes the director of the Bureau of Mines to collect and publish statistics as to the production, manufacture and marketing of crude petroleum.

H. R. 175, by Mr. Randall, of Oklahoma. This resolution is discussed at length in another column.

H. R. 406 which authorizes the exploration for and disposition of coal, phosphates, oil, gas, potassium and sodium, was called up in the Senate April 24, but owing to objections it could not be considered by unanimous consent. There is a chance however that it may be possible to pass this bill the next day the calendar is taken up in the Senate.

H. R. 6884, by Mr. Carter, of Oklahoma. This bill relates to the payment of royalties on coal lands in the Choctaw and Chickasaw Nations. Action on this bill by the House Committee on Indian Affairs is improbable, owing to the fact that H. R. 12344 practically takes its place.

TUNGSTEN BASE OF LARGE AND SPECTACULAR PROFITS

The unprecedented demand for tungsten has resulted in such prices as to make it the source of numerous comfortable fortunes. In fact tungsten is taking a place along with gold as a basis for spectacular accumulation of profits.

One of the latest incidents of this character is that of a prospector in California, whose financial condition until very recently was not such as to call for any classification in Dun's or Bradstreet's. He was the owner, however, of a tungsten prospect adjoining the property of the Atolia Mining Company in the Randsburg district of California. Information, apparently reliable, has reached Washington that this prospector has cleared \$300,000 as a result of his foresight in locating a tungsten property. When it is considered, however, that tungsten is now more valuable than silver, such profit is not so remarkable.

The metal has become so valuable as to have stimulated high grading in the properties where it is mined. An unscrupulous workman would have little difficulty in secreting about his person picked ore worth \$10.00 or more it is said.

Zinc and Copper Cases Dismissed

The suit of the United States Metal Refining Co. vs. the United States has been dismissed by the U. S. Court of Customs Appeals. The case had to do with zinc and zinc-bearing ore and the valuation of copper ore.

GRAPHITE INDUSTRY STIMULATED GREATLY BY WAR DEMAND

"Because of its use in the manufacture of crucibles and for foundry facings graphite is a mineral resource of vital importance in time of war," according to Edson S. Bastin, the specialist of the Geological Survey in charge of this mineral. "The effect of the European war upon the graphite industry in this country during 1915 is very interesting," says Mr. Bastin, "and in general the industry was greatly stimulated by the increased demands for graphite products, particularly crucibles. Many American producers of flake graphite reported greatly increased productions. Most crucible makers greatly increased their outputs, though unable to take full advantage of the increased demands because of the difficulty in obtaining adequate supplies of graphite of crucible grade. In the mining and concentration of flake graphite particular activity was displayed in Alabama where one new plant, built in 1914, became an important producer in 1915 and where three new properties are now being opened but have not yet reached the producing stage."

Makes New Brand of Explosive

"Arctic is the name of a new brand of explosives which the Du Pont Company is now prepared to manufacture in unlimited quantities. They are truly non-freezing under the most severe winter conditions," says the Du Pont magazine. "They are quite water resisting but should not be used in submarine work. They can be used in driving tunnels, shafts or other close work as the fumes given off on detonation are not obnoxious, and will not cause headaches. They can be furnished in all standard size cartridges. If necessary, they can be packed in bulk, in paper bags which are in turn enclosed in wooden cases. To properly detonate them nothing less in strength than a No. 6 (Red Label) detonator may be used.

"Arctic is made in five different strengths. They can be used in work such as quarry blasting, tunnels, shaft sinking, mining, subsoiling, tree planting, stump blasting, ditching by the electrical method, breaking up ice jams and many other kinds of work.

"Arctic powders contain no nitroglycerine and are therefore materially cheaper than straight or extra grades. Their velocity of detonation is even quicker than straight dynamites," says the Du Pont magazine.

Frederick G. Clapp, managing geologist of the petroleum division of the Associated Geological Engineers, has removed his headquarters from Pittsburgh to New York City, and has purchased a home in Bronxville, N. Y. The Pittsburgh office will be retained under the same management.

PROBABILITIES OF SLUMP IN COPPER SMALLER, IT IS BELIEVED

The opinion is growing in Washington that copper producers need fear no slump in prices following the definite information that peace is in sight in Europe. Each month is seeing an accumulation of more definite information with regard to the copper supply in the central countries, and, for that matter, in the allied countries as well.

It has been learned here that very extensive mining operations are in progress in German, Austrian and Servian copper mines. Despite this there is evidence that Germany is experiencing the greatest difficulty in securing adequate supplies of this metal. This is not based on the fact that copper articles throughout Germany were commandeered a year or more ago. It is believed that this was done more in anticipation of a shortage in copper rather than through any dire necessity at the time.

Reports of British analyses of shells, which fall in their lines, indicate that very soft steel is being used to some extent as a substitute for copper.

MINE OPERATORS SLOW IN MAKING STATISTICAL RETURNS

Mineral producers throughout the United States are not replying to the statistical inquiries from the Geological Survey as promptly this year as has been the case previously. There is evidence that the preliminary estimates, which were made the first of the year, are satisfying many of the producers and detracting somewhat from their interest in the completed statistics.

Attention is called by the Director, of the Geological Survey to the fact that these estimates at the first of the year and on July 1 are not expected in any way to take the place of the final statistics. He pointed out that while every effort is made to secure the most reliable figures obtainable for these reports, it is impossible to obtain the accuracy or the details within a day or two following the close of the year, or the half year period, as is contained in the completed reports.

Postal Statement

Complying with the postal law of August 24, 1912, the MINING CONGRESS JOURNAL submits the following information to its readers: the JOURNAL is published monthly at 744 Munsey Building, Washington, D. C. Editor, J. F. Callbreath, business manager, J. F. Callbreath; publisher, The American Mining Congress; owners, The American Mining Congress. There are no stockholders or bondholders. (Signed) J. F. Callbreath, editor. Sworn to and subscribed before me this thirtieth day of March, 1916, P. H. Hill, Notary Public.

MINERAL RESOURCES WORK GETS AN EARLY START

By issuing the first section of its Mineral Resources report April 10 an unusually good start was obtained on this work, of the Geological Survey, giving complete data on the production for 1915. Last year the first section of this report did not appear until April 29. The first publication this year was that on Chromic Iron Ore by J. S. Diller.

STANDARDIZATION COMMITTEE TO HAVE REPORT SOON

Geo. R. Wood, Chairman of the Standardization of Equipment in Coal Mines Committee of the American Mining Congress, says his committee expects to have something shortly on standardizing of wheels, axles and bearings on mining locomotives which will be of interest to the mining fraternity.

"We have materials standardized for locomotives of thirteen tons and larger," Mr. Wood says, "and we are trying to get some common basis for small size gathering locomotives. If this can be accomplished, it will permit standardizing the above parts for all locomotives of the same weight, although made by different manufacturers."

SELLS TUNGSTEN FOR TWENTY TIMES ITS ORIGINAL COST

An incident which shows the striking increase in the price of tungsten took place recently in the Geological Survey. In 1910 one of the geologists purchased two pounds of tungsten metal simply with the idea of having some of it to show persons interested. He paid \$1.30 for the two pounds which he purchased.

Having found that he had little use for this tungsten he shipped it to a buyer recently and in return for it received a check for \$21.30.

NEARLY EVERY LATHE IN U. S. BUSY TURNING OUT SHELLS

Practically every machine shop in the United States has all the work it can handle, according to information reaching Washington. A considerable portion of this business is due to war orders.

An interesting feature of the manufacture of shrapnel shells is the fact that, with the development of tungsten steel, it is cheaper to turn them out of solid bars than it is to cast them. Steel is being furnished in round bars of suitable length and nearly every lathe in the country is being used to take the next step in their manufacture.

PERSONALS

J. C. McKinley, of Wheeling, W. Va., was in Washington last month, and called at the Mining Congress office in regard to the work of his committee on Uniform Mine Accounting.

Kirby Thomas stopped in Washington last month on his way South.

Carl Scholz, president of the American Mining Congress, spent several days in Washington last month on business. Miss Margaret Scholz, his daughter, accompanied him on the trip.

Dorset Carter, of McAlester, Okla., has returned to his home after spending several days in the East.

J. H. Hibben, of Parsons, Kans., was one of the party who called upon the Secretary of the Interior last month in regard to the Oklahoma coal mines.

R. R. Allen, vice-president, District 21, Southwestern Coal Operators' Association, and Frank Drew, secretary, have returned to their homes after spending several days in Washington.

Dr. L. D. Rickets, has returned to New York after a several weeks' trip in South America.

James McConnell was one of the Oklahoma operators who spent several days in Washington last month.

J. F. Callbreath, secretary of the American Mining Congress, is now in Denver, on business matters pertaining to the organization. He will be in Washington again during the early part of this month.

E. W. Shaw, oil specialist with the Geological Survey, made a trip to the Tampico oil fields of Mexico last month.

A. H. Brooks, Sydney Paige, H. G. Ferguson and Fred Hunter, geologists with the Geological Survey, will participate this month in the military training camp at Fort Oglethorpe, Ga.

J. S. Diller, of the Geological Survey, and Arthur L. Day, of the Carnegie Geophysical Laboratory, addressed the Geological Society of Washington, April 12 on "Lassen Peak, California."

Harry L. Day, formerly president of the Federal Mining and Smelting Co., and a director of the American Mining Congress, has started an independent smelter, at Northport,

on the Columbia River, close to the boundary line between British Columbia and the State of Washington. Mr. Day also controls the Hercules, Tamarack and Chesapeake mines in the Canyon Creek district, in the Coeur d'Alene region of Idaho, near Kellog.

Charles Estemere, of Flat, Alaska, has left the interior and is on his way to Anchorage, where he expects to arrive sometime in June.

Crocoite a Rare Mineral

Crocoite, or lead chromate, is a very unusual mineral. So far as known to the United States Geological Survey, however, the material is valued only for the lead it contains and any precious metals which may be associated with the crocoite.

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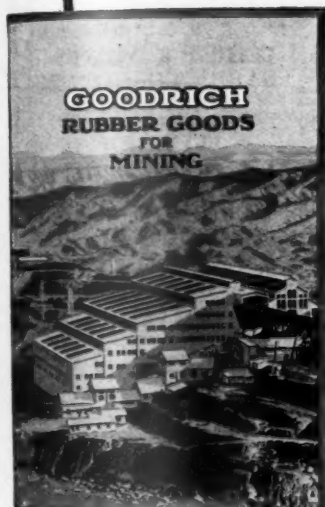
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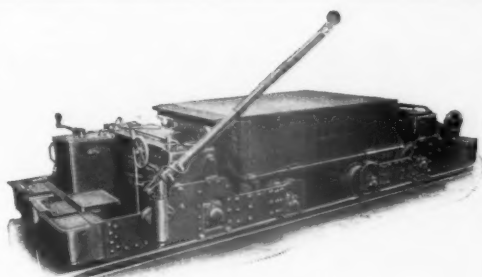
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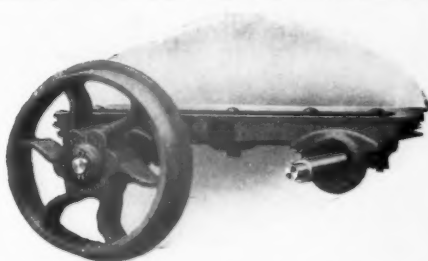
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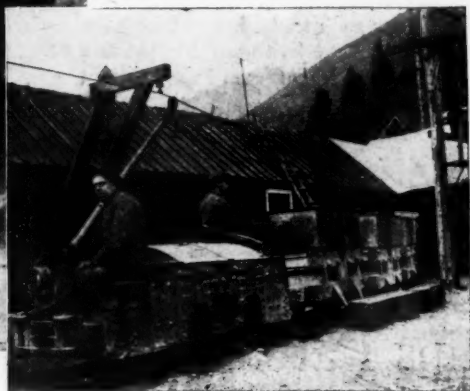
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